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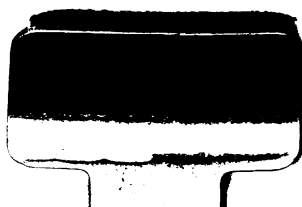
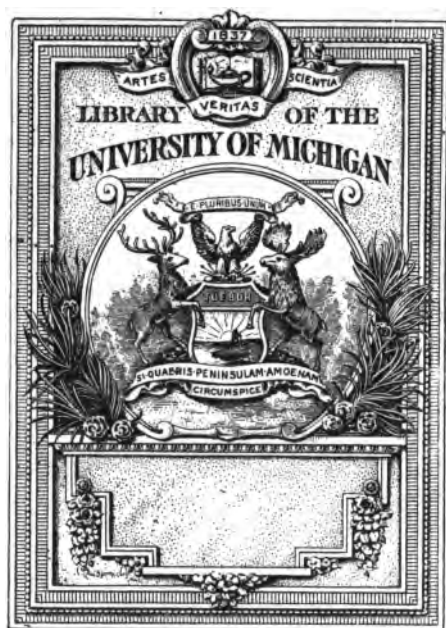
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TRANSACTIONS  
OF THE  
KANSAS  
State Horticultural Society,  
(ORGANIZED IN 1869.)

CONTAINING  
THE PROCEEDINGS OF THE THIRTY-FIFTH ANNUAL  
MEETING, TOPEKA, DECEMBER, 1901.

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VOL. XXVI.

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EDITED BY THE SECRETARY, WILLIAM H. BARNES.  
PUBLISHED BY THE STATE.



TOPEKA:  
W. Y. MORGAN, STATE PRINTER.  
1902.

## LETTER OF TRANSMITTAL.

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ROOMS OF THE KANSAS STATE HORTICULTURAL SOCIETY,  
STATE CAPITOL, TOPEKA, February 1, 1902.

*To Hon. W. E. Stanley, Governor :*

We take pleasure in presenting to your notice this twenty-sixth volume of the Transactions of the Kansas State Horticultural Society, containing a report of its thirty-fifth annual meeting, and hope for your congratulations on the prosperity and progress of horticulture in our state. We believe the Society is of great benefit to the citizens of the state, but that it should have greater privileges; notably that of obtaining correct statistics of tree planting and horticultural production, which can only be correctly done through the township trustees.

Hoping this report, and the work of the Society, may meet with your warmest approbation, we respectfully submit the same.

FRED. WELLHOUSE, *President.*

WILLIAM H. BARNES, *Secretary.*



## OFFICERS.

FRED. WELLHOUSE, *President* ..... Topeka.  
 J. W. ROBISON, *Vice-president* ..... El Dorado.  
 FRANK HOLSINGER, *Treasurer* ..... Rosedale.  
 WILLIAM H. BARNES, *Secretary* ..... State-house, Topeka.  
 PROF. E. A. POPENOE, *Entomologist* ..... St. Agr. Coll., Manhattan.

## TRUSTEES.

First Dist....E. J. HOLMAM, Leavenworth.	Fifth Dist....WM. CUTTER, Junction City.
Second " ....B. F. SMITH, Lawrence.	Sixth " ....J. J. ALEXANDER, Norton.
Third " ....F. L. KENOYER, Independence.	Seventh " ....GEO. W. BAILEY, Wellington.
Fourth " ....GEO. M. MUNGER, Eureka.	

## ROLL OF MEMBERS.

### HONORARY.

Colman, Norman J., St. Louis, Mo. Cowgill, E. B., Topeka, Kan. Evans, J. C., Harlem, Mo. Gano, W. G., Parkville, Mo. President of the State Agricultural College, Manhattan, Kan. Chair of Chemistry and Mineralogy, State Agricultural College, Manhattan, Kan. Chair of Botany and Horticulture, State Agricultural College, Manhattan, Kan. Chair of Zoology and Entomology, State Agricultural College, Manhattan, Kan. Chair of Household Economy and Hygiene, State Agricultural College, Manhattan, Kan. Chair of Industrial Art and Design, State Agricultural College, Manhattan, Kan. Lantz, Prof. D. E., Chapman, Kan. Kedzie, Prof. R. C., Agricultural College, Michigan. Bailey, Prof. L. H., Cornell University, Ithaca, N. Y. Burrill, Prof. T. J., Secretary of American Society of Microscopists, Champaign, Ill. Forbes, Prof. S. A. State Entomologist, Champaign, Ill. Lintner, Prof. A. J., State Entomologist, Albany, N. Y. Plank, Prof. E. N., Botanist, Kansas City, Kan.	Goodman, L. A., Westport, Mo. Murtfeldt, C. W., Kirkwood, Mo. Kelsey, Prof. S. T., Kawana, N. C. Snow, Prof. F. H., Lawrence, Kan.
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### LIST OF LIFE MEMBERS RESIDING IN KANSAS.

Alexander, J. J., Norton, Norton county. Bailey, Geo. W., Wellington, Sumner county. Baldwin, S. J., Seneca, Nemaha county. Barnes, William H., Topeka, Shawnee county. Barnes, J. T., Beloit, Mitchell county. Bayles, Geo. A., Topeka, Shawnee county. Beebe, Mrs. Elizabeth, Columbus, Cherokee co. Beckley, J. C., Spring Hill, Johnson county. Blair, Geo. A., Sylvan, Sumner county. Bohrer, Dr. G., Chase, Rice county. Booth, William, Winchester, Jefferson county. Bowen, P. C., Cherryvale, Montgomery county. Brazeltine, John, Wathena, Doniphan county. Brooke, A. L., North Topeka, Shawnee county. Browne, Geo. E., Topeka, Shawnee county. Buckman, A. H., Topeka, Shawnee county. Buell, D. G., Willis, Brown county. Bullard, H. S., Tonganoxie, Leavenworth co. Cecil, J. F., North Topeka, Shawnee county. Chandler, M. E., Argentine, Wyandotte co. Clark, J. G., Waukegan, Shawnee county. Coburn, F. D., Kansas City, Wyandotte co. Cook, C. C., Bradford, Wabaunsee county. Cook, Thos. F., Effingham, Atchison county. Cousins, John, Eskridge, Wabaunsee county. Curry, J. W., Winchester, Jefferson county. Cutter, William, Junction City, Geary county. Dickens, Albert, Manhattan, Riley county. Dickinson, A. E., Meriden, Jefferson county. Dickinson, S. S., Larned, Pawnee county.	Diehl, E. P., Olathe, Johnson county. Dixon, F. W., Holton, Jackson county. Eames, W. B., Delphos, Ottawa county. Entsminger, A. L., Silver Lake, Shawnee co. Ferris, H. L., Osage City, Osage county. Fulcomer, John, Belleville, Republic county. Geyer, Miss E., Leavenworth, Leavenworth co. Graham, I. D., Manhattan, Riley county. Grey, E. M., Topeka, Shawnee county. Griess, A. C., Lawrence, Douglas county. Harris, E. P., Leecompton, Douglas county. Harris, F. B., ..... Harrison, T. W., Topeka, Shawnee county. Hitchcock, Prof. A. S., Manhattan, Riley co. Holman, E. J., Leavenworth, Leavenworth co. Holsinger, C. V., Rosedale, Wyandotte county. Holsinger, F., Rosedale, Wyandotte county. Holsinger, Geo., Rosedale, Wyandotte county. Holsinger, G. L., Rosedale, Wyandotte county. Irwin, C. W., Wichita, Sedgewick county. Johnson, Mrs. V. M., Highland, Doniphan co. Jordan, F. S., Wakarusa, Shawnee county. Kenoyer, J. L., Independence, Montgomery co. Kern, H. H., Bonner Springs, Wyandotte co. Lake, John W., Walden, Russell county. Lawrence, R. E., Wichita, Sedgewick county. Leach, J., St. Mary's, Pottawatomie county. Leach, L. W., Wichita, Sedgewick county. Litson, W. H., Benton, Butler county. Longstreth, C. H., Lakin, Kearny county.
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## LIFE MEMBERS RESIDING IN KANSAS—CONTINUED.

Lux, Phillip, Topeka, Shawnee county.  
 Lyon, E. H., Udall, Cowley county.  
 Maffet, Geo. W., Lawrence, Douglas county.  
 Martindale, C. D., Scranton, Osage county.  
 McMasters, John, Eskridge, Wabaunsee co.  
 McNicol, James, Lost Springs, Marion county.  
 Meser, J. J., Hutchinson, Reno county.  
 Miller, E. L., Seneca, Nemaha county.  
 Moeser, William, Topeka, Shawnee county.  
 Mohler, Martin, Topeka, Shawnee county.  
 Moser, M. R., Wichita, Sedgwick county.  
 Mosher, J. A., Rydal, Republic county.  
 Munger, G. M., Eureka, Greenwood county.  
 Munberry, H. J., Galena, Cherokee county.  
 Oberndorf, A. jr., Centralia, Nemaha county.  
 Panceast, B. F., Iola, Allen county.  
 Parker, Mrs. B. F., Haviland, Kiowa county.  
 Phillips, B. A., Osborne, Osborne county.  
 Popenoe, Prof. E. A., Manhattan, Riley co.  
 Rhodes, Henry, Gardner, Johnson county.  
 Richardson, Geo. C., Leavenworth.  
 Ringle, W. E., Independence, Montgomery co.  
 Roberts, H. R., Perry, Jefferson county.  
 Robison, J. W., El Dorado, Butler county.  
 Rubart, Miss Lizzie, Junction City, Geary co.  
 Rude, F. P., Topeka, Shawnee county.

Schlichter, J. B., Sterling, Rice county.  
 Scott, A. E., Meriden, Jefferson county.  
 Sharp, James, Parkerville, Morris county.  
 Sheffield, C. H., Topeka, Shawnee county.  
 Shields, H. S., Garnett, Anderson county.  
 Shoe, L. A., Highland, Doniphan county.  
 Smith, B. F., Lawrence, Douglas county.  
 Smith, W. W., Le Roy, Coffey county.  
 Smyth, B. B., Topeka, Shawnee county.  
 Stayman, Dr. J., Leavenworth.  
 Sutton, A. H., Independence, Montgomery co.  
 Taylor, Edwin, Edwardsville, Wyandotte co.  
 Taylor, T. T., Hutchinson, Reno county.  
 Underwood, W. H., Hutchinson, Reno county.  
 Wellhouse, Fred., Topeka, Shawnee county.  
 Wellhouse, Walter, Topeka, Shawnee county.  
 Wheeler, E. D., Wa Keeney, Trego county.  
 Whetstone, J. H., Pomona, Franklin county.  
 Whiteker, Geo. P., Topeka, Shawnee county.  
 Williams, J. L., Kansas City, Wyandotte co.  
 Williams, J. W., Holton, Jackson county.  
 Wolverton, E. K., Barnes, Washington co.  
 Yaggy, A. F., Hutchinson, Reno county.  
 Yaggy, E. E., Hutchinson, Reno county.  
 Yaggy, L. W., Hutchinson, Reno county.

Secretary of Manhattan Horticultural Society.

Secretary of Johnson County Horticultural Society.

## LIFE MEMBERS NOT RESIDING IN KANSAS.

Allen, Abner, College Park, Cal.  
 Brackett, G. C., Fresno, Cal.  
 Converse, D. C., Fort Atkinson, Wis.  
 Daniels, E. T., Waynoka, Okla.  
 Davidson, C. M., Cincinnati, Ohio.  
 Dobbs, J. B., Lima, Ohio.  
 Fosnot, W. E., Keosauqua, Iowa.  
 Gale, Prof. E., Mangonia, Fla.  
 Godfrey, A. N., Dayton, Wash.

Hall, M., Oklahoma.  
 Hicks, John S., Roslyn, N. Y.  
 Irvin, W. A., El Paso, Tex.  
 Milliken, Robert, Nampa, Idaho.  
 Snyder, Wm., Ben Lomond, Cal.  
 Taylor, E. A., Arcadia, Tex.  
 Van Deman, H. E., Parksley, Va.  
 Weidman, J., Oklahoma.

## ANNUAL MEMBERS FOR 1902.

Baldwin, Roy S., Seneca.  
 Benedict, E. W., Topeka.  
 Bradley, R., Abilene.  
 Carter, H. C., Baldwin.  
 Cellar, W. D., Edwardsville.  
 Chandler, A., Randolph, Mo.  
 Crow, S. M., Topeka.  
 Goble, Francis, Wallula.  
 Goodell, H. E., Tecumseh.  
 Graves, J. M., Effingham.  
 Griesa, A. H., Lawrence.

Irvin, J. M., St. Joseph, Mo.  
 Remsburg, J. E., Oak Mills.  
 Richmond, R. A., Lenora.  
 Scrimscher, W. F., Silver Lake.  
 Skinner, J. H., North Topeka.  
 Smith, C. S., North Topeka.  
 Snyder, Edwin, Oskaloosa.  
 Stewart, Thomas, Hoyt.  
 Tuttle, D. D., Vinland.  
 Van Orsdol, B. F., Silver Lake.  
 Whitaker, E. J., Topeka.

## DELEGATES TO THIRTY-FIFTH ANNUAL MEETING.

Leavenworth County Horticultural Society, Carl Holman and John Burre.  
 Manhattan Horticultural Society, A. J. Nicholson.  
 Missouri Valley Horticultural Society, H. S. Wheeler and J. S. Perkins.  
 Montgomery County Horticultural Society, W. E. Ringle.  
 Osage County Horticultural Society, M. Arnold and C. D. Martindale.  
 Saline County Horticultural Society, F. G. Barker and Alfred Jones.  
 Wabaunsee County Horticultural Society, Samuel Harris and Mrs. Samuel Harris.  
 Wyandotte County Horticultural Society, J. S. Perkins and C. A. Chandler.

## CONSTITUTION OF THE SOCIETY.

**Article 1.**—This association shall be known as the Kansas State Horticultural Society.

**Art 2.**—Its object shall be the promotion of horticulture.

**Art. 3.**—Its members shall consist of (1) honorary members, persons of distinguished merit in horticulture, elected by a majority vote of the Society; (2) life members, persons paying five dollars to the secretary at one time; and (3) annual members, persons paying one dollar to the secretary, membership of same to cease on the first day of the following annual meeting, unless renewed.

**Art. 4.**—The legislative body of this Society shall consist of life members, two delegates from each auxiliary society, and annual members of one year's standing.

**Art. 5.**—Its officers shall be a president, vice-president, secretary, and treasurer, elected by ballot at the annual meeting in even years. They shall serve for the term of two years, or until their successors are elected and qualified.

**Art. 6.**—There shall be elected, biennially, a trustee from each congressional district, who shall serve for two years or until a successor shall have been elected and qualified. These trustees, together with the president, vice-president, secretary, and treasurer, shall constitute an executive board. The president, secretary and treasurer shall constitute the executive committee.

**Art. 7.**—The terms of its officers and trustees, excepting the secretary and treasurer, shall begin immediately on adjournment of the annual meeting at which they shall be elected; that of the secretary and treasurer shall begin July 1 following their election.

**Art. 8.**—This Society shall hold its annual meeting in Topeka during the month of December. Semiannual meetings may be held at such time and place as the executive committee shall determine.

**Art. 9.**—The official seal of this Society shall consist of a circular disk, and shall contain thereon the following: "Kansas State Horticultural Society, 1869. *Ad astra per aspera*. Man's first occupation." With appropriate illustration.

**Art. 10.**—This constitution may be changed or amended by a two-thirds vote of the members present at any annual meeting, provided such change or amendment shall have been submitted and read at the last preceding annual meeting.

### BY-LAWS.

**Section 1.** It shall be the duty of the president to preside at all meetings of this Society and of the executive board, and perform such other duties as may devolve upon him.

**Sec. 2.** The vice-president shall, in the absence or inability of the president, perform the duties of said office.

**Sec. 3.** It shall be the duty of the secretary to keep a full record of the proceedings of this Society; to have charge of the official seal and keys of the So-

ciety's rooms, and full care of all books, papers, furniture, diplomas and other property pertaining to or belonging to this Society; also to represent this Society in all its correspondence. He may, by consent of the executive committee, appoint a deputy and employ necessary help; and shall receive all money due this Society, paying same (excepting state appropriation) to the treasurer, taking his receipt therefor. He shall encourage and assist in organizing auxiliary societies throughout the state, gather and record statistics, make a complete report of his office at each annual meeting, and compile annually a report of the transactions of this Society for publication.

Sec. 4. It shall be the duty of the treasurer to receive from the secretary all money (except state appropriation) belonging to this Society, and pay out the same upon order of the secretary, countersigned by the president. He shall keep an account of the funds in his charge, and make an annual report to this Society. At the expiration of his term he shall turn over to his successor all books, accounts and money remaining in his hands or possession.

Sec. 5. It shall be the duty of the executive committee to assist the secretary in compilation of the report for publication; to perform the duties of the executive board between meetings; supervise the disposal of all money of this Society, and perform such other duties as the executive board may prescribe.

Sec. 6. The executive board shall have full control of all the affairs of this Society; shall appoint standing committees at the close of each annual meeting for the ensuing year on all subjects of interest to Kansas horticulture; each standing committee to make a written report, through its chairman, to the annual meeting following their appointment. It shall hold a board meeting on the day preceding the annual meeting, and again immediately after adjournment of the annual meeting.

Sec. 7. By a two-thirds vote of the members present at any annual meeting, these by-laws may be changed or amended.

# TRANSACTIONS

OF THE THIRTY-FIFTH ANNUAL MEETING OF THE KANSAS  
STATE HORTICULTURAL SOCIETY, MET IN TOPEKA,  
THURSDAY, DECEMBER 26, 1901.

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## First Day—Afternoon Session.

The thirty-fifth annual meeting of the Kansas State Horticultural Society was called to order by President Wellhouse promptly at three o'clock p. m.

Prayer was offered by Rev. S. C. Coblenz, pastor of the First United Brethren Church of Topeka.

### ANNUAL REPORTS OF TRUSTEES.

**PRESIDENT WELLHOUSE:** The first business on the program is the report of the trustees, by congressional districts, on horticultural conditions and progress. The year 1901 has been one of the most remarkable seasons Kansas ever passed through, and it is presumed that these representatives have investigated and studied the conditions and that they will report results. We expect them to confine themselves as much as possible to the conditions and results of the past season. The first district is represented by Trustee E. J. Holman, of Leavenworth county.

#### FIRST DISTRICT.

**MR. HOLMAN (Leavenworth):** In Leavenworth county, the past year has been one of disappointment and some confusion. We had in the springtime the most glowing promise of as abundant a small-fruit crop as we ever had. We commenced harvesting strawberries and were about half way through when we began to feel the effects of the drought. It cut that crop in two, and left us but few blackberries or raspberries. I might say that the drought practically destroyed our small-fruit crop; and we were feeling very "blue"—I presume other small-fruit growers of the state were—and not of this state only, but of Missouri as well. I can better illustrate the feeling that existed by telling a little incident occurring between one of my patrons and myself. He bought, as usual, quite a liberal bill of our nursery stock in the spring. I met him on the street some time in July, and asked him if he was ready to pay anything on account, and he looked at me pitifully and said: "My God, I have eight children to feed. I owe some money. I have n't got a thing to sell, and everything is blasted." There was no hope left to that man, seemingly. He did not know whether he was going to get a peach or anything else unless he borrowed some money. It looked as though the rest of the year would be for him blank—one of the blankest of blanks. It ran on thus until we thought the peaches, apples, pears and plums were gone; then rain came and hope began to revive. I am glad to say—and I rejoice as you do to-day—that sufficient rain came to give us a surprising crop of large fruits.

A little more about that man: That man sold over \$1000 worth of peaches, and over \$2000 worth of apples, from only a little forty-acre farm near Leaven-

worth. One day I happened to meet him on the street and said, "Well, I suppose now you have more money than you want," and he replied, "You need n't say any more," and got right out of his wagon and paid my bill. He said, "I have more money than I had." That is one of the good results of this year. I presume that has been the experience of many. Speaking to-day of the conditions that existed and of the promises apparent for another year, the future does not look all good, because some effects of the drought still linger. It hindered the growth of strawberry plants, and I do not believe there is a good, strong planting of strawberries in the state, except perhaps, where irrigated. We will not have a crop of strawberries in our section next year. We will not have a crop of blackberries, though we will have, probably, more blackberries in proportion to a full crop—more than all other berries. Our currant bushes lost all their leaves and a great many seemed dead; but after the rain came they put on new leaves and went through all right; gooseberries, likewise. The condition of fruit-trees continues exceptionally good. There is no reason, from the present condition of apple buds, why we should not have more apples in 1902 than we had in 1901, barring droughts and things unforeseen.

A MEMBER: You spoke about blackberries not promising any good for another season. Did the plants grow and mature well this fall before cold weather set in?

MR. HOLMAN: They were stunted by the summer drought. They came through, as also did the raspberries and strawberries, and made a small crop. But of strawberries we have little narrow rows where we ought to have beds three feet wide. We have no strawberry plants to sell.

A MEMBER: How was your potato crop? Was it a failure?

MR. HOLMAN: I raised pretty near enough potatoes to do me.

#### SECOND DISTRICT.

B. F. SMITH (Lawrence): Horticulture report on conditions and progress, for second district. Owing to the great drought from April 18 to July 27, the strawberry, raspberry and blackberry crops were near being a failure. There were only four pickings of small strawberries. There were three pickings of cap raspberries. The red varieties did considerably better. With the exception of Early Harvest, blackberries dried on the bushes. The Early Harvest turned out four pickings. Kansas and Egyptian were the best of the cap. Raspberries: Loudon, Miller and Cardinal best of the red sorts. Gooseberries ripened all their fruit; none dried up, as did other small fruits. Currants did fairly, but were deficient in size.

*Peaches.*—Best crop ever raised in Douglas county. The favorite variety is Elberta, followed by Mountain Rose, Champion, Triumph, Crosby, Stump, Crawford, Foster, Mixon Free, Mixon Cling, Early Rivers, Smock, and others. It is generally conceded that the drought was favorable to the perfect ripening of the peach crop. Next spring there will be more peach-tree planting in our district than for several years. Owing to the unusual sweetness of most of our peaches, they were more largely consumed in Lawrence than at any previous year. There were no peaches on the bottom lands worthy of mention; hence it is safe to say that our highlands are much more sure than the lowlands.

*Apples.*—Excepting the Ben Davis, there was a good crop of apples in the second district. Missouri Pippins were more beautifully colored than usual. Winesaps were not large, but were handsomely colored. Jonathan, in size, not quite up to former years, but the fruit sold for from ten to twenty-five cents per bushel more than other sorts. Plums on Kansas river bottom land did well, but on uplands they were unprofitable.

*Pears.*—There was three-fourths of a crop. Owing to drought they were not over two-thirds the usual size, especially the Seckel variety. Kieffer was a full crop. Shippers rejected from one-fourth to one-third of the apples hauled into Lawrence by farmers. Many culls were sold to grocerymen for from twenty-five to sixty cents per bushel.

Interest in fruit culture is not abating; peach and apple growing are increasing.

*Berry Culture.*—While the acreage will not be much increased, better culture, with fewer varieties and better sorts, will receive more attention.

#### THIRD DISTRICT.

F. L. KENOYER (Independence): Independence, where I reside, is located near the geographical center of the third congressional district; so the fruit conditions and prospects of the section with which I am most familiar is a fair general representation of the entire district. The year now closing has been in more ways than one a record-breaker. We have had but one rain in the entire year that wet the ground deeper than it was plowed; that was about the middle of April. Before that rain the ground was a little too dry for transplanting tree or plant; after the rain it was too late for further transplanting, and too dry and hot for what had been transplanted. J. M. Altaffer, of Independence, has for more than thirty years kept the weather record of the government signal service bureau for our section of the state. His record is the longest continuous weather record in the state, excepting those of the agricultural college and university. He reports June as the driest and July as the hottest month on record. On the night of June 22 we had a severe wind storm, with the temperature up in the 90's, that blew off fully one-half the tree fruits and damaged what remained. What leaves were left on fruit-trees, canes and vines were riddled and scorched by the hot wind. Blackberry and raspberry canes were badly broken and much of the fruit either destroyed or damaged.

July gave us but one day on which the mercury did not reach ninety or over. We had twenty-five days in that month with a temperature of 100 or over, and two days with a temperature of 111, which is two degrees higher than ever before recorded there. Under this tropical heat and lack of moisture most spring-set nursery stock, excepting where carefully nursed and petted, perished. By the last of July the immature fruit on the trees was so shriveled and baked that a total failure seemed inevitable. Subsequent showers however, revived the shrunken fruit and started it to growing and it developed into a fair crop, about up to the normal in size and quality.

Of the tree fruits, cherries were a full crop, as they ripened before the drought had reached its worst stage; plums were nearly a failure; peaches were the finest in size and quality we have had in ten years; pears gave a good crop, of excellent quality; apples gave a light crop, of better keeping quality than usual.

Of the berry fruits, strawberries yielded nearly a full crop, being but little affected by the drought; raspberries produced eighty per cent., the shortage being caused by the June wind-storm. The Early Harvest blackberry ripened about forty per cent. of its fruit, the remainder drying on the bushes; the Kittatinny matured only five per cent. of its fruit, the famous Snyder did not ripen a berry; the Lucretia dewberry brought only one-fourth of its fruit to perfection; grapes were about a half crop. Many blackberry and strawberry plantations died, and these fruits will be scarce next year. Grapes will also be a short crop, as the vines were so overtaxed in developing their fruit that much of the new wood died. All other fruits seem to be in good condition for a full crop the coming season.

As berries and grapes will be scarce next year, those who have them for market may expect fancy prices.

But few persons take much interest in horticulture in my district, except in Labette county, where they maintain two live horticultural societies—one at Altamont, the other at Oswego.

Since writing the foregoing, the weather has again broken the record. On December 11 wild verbenas were blooming by the roadside; pansies and chrysanthemums were in full bloom in the gardens; scattering blossoms were to be seen over the strawberry plantations; blackberries were retaining most of their leaves; turnips were growing luxuriantly in the open ground. Within three days thereafter old Boreas sent the mercury down to six below zero. I do not apprehend any injury to the fruit crop from this sudden change in temperature.

My experience and observation have convinced me that the longer the growing season of our fruit plants continues, the better those plants are fitted to withstand sudden changes and low temperatures.

#### FOURTH DISTRICT.

J. W. ROBISON (El Dorado): We had a bad spring, followed by dry weather until the middle of August; then extreme wet. We have had two wet spells and a dry summer. The small fruits did little good. Early varieties of peaches were unsatisfactory; the later varieties recovered and had about their usual flavor; late peaches were never better; all of the medium and late peaches bore full crops and of normal size. Apples set well, but fell badly when about the size of beans, and through the dry weather they neither grew nor fell off. When the wet weather came we never had a better developed or more productive crop.

Butler county, in which I live, had the largest, finest-developed crop of apples this year ever grown in it. In and around El Dorado, where rarely any apples are shipped, there were nearly 200 car-loads sent east and south, to England, and up the Missouri river to cold stores. Our pear, plum and grape crops were good. The peach buds are at the present time less developed, I think, than I ever saw them. The cool wave that came after the middle of December found peach and apple trees in full leaf—a strange thing for the time of year so far south. In fact, apples kept growing, and did n't seem to know when to stop, after the rains came; and when we gathered the first picking of Ben Davis, Winesap, and Jonathan, there were small apples on the lower branches of the trees that were not colored, which finally grew to ordinary size and of good color. Many bushels developed to full size after the first picking had been made. Peaches held their leaves, and it looked strange to see leaves hanging on all trees so late. Pickers from Colorado said every leaf was off the trees there, and when they arrived in Butler county they found it as green as summer. There was no dropping; the apples had to be pulled from the trees; many took a small part of the limb with them. The condition of the trees seems to be fairly good, and conditions appear favorable for next year.

Late peaches were so good in our county this year that I think the larger percentage of all varieties were sold. We found a good market west. Six below zero was the lowest the mercury got in December in our region, and I do not think it harmed the buds at all. They are not fully developed. If there is any lack in peach buds with us I think it is because they are not sufficiently developed, but I have never known that to interfere with the following crop.

#### FIFTH DISTRICT.

WILLIAM CUTTER (Junction City): The early part of the season was favorable and everything started promisingly—more so than usual. The good weather hung



on until strawberry picking was over. We had a very good crop of strawberries. Raspberries did poorly; the vines were dwarfed and this late December cold snap caught them in full leaf; so I think the prospects small for next year. There can be very few blackberries. Tree fruits did much better; still, the dry weather which began the latter part of June damaged all peaches as late as Elberta, and reduced them in size and damaged their flavor. Later varieties were larger. All the late peaches did the finest ever.

Apple trees went into winter in good shape. They shed their leaves before very cold weather and I think their condition excellent. Our early apples were nearly a failure because of dry weather up until after Maiden Blush. Varieties coming after that made fine, well-colored fruit, and with but little dropping excepting damaged specimens. There was more damaged fruit than we like to have. We think our apple trees have gone into winter quarters in good condition, and satisfactory to us.

Like Mr. Robison, I am very much in favor of planting late peaches. We seldom have a fall that we do not have plenty of rain after August, and that always makes late peaches good, while our early ones are frequently dwarfed by dry weather. During dry weather we thought insects would get all our apples, but after the rains came they did n't seem to do any damage; we sprayed all our trees, some with liquid spray. We did n't leave any but what were sprayed. I have an idea it did good. It satisfied us to think we had done our best.

#### SIXTH DISTRICT.

J. J. ALEXANDER (Norton): Our progress has been slow, owing to location of our district, it being the twenty-two northwest counties of the state; but we have kept pace with the rest of the state. Of course, we have not yet attained what we expect to in the future. Our progress must be slow, for we have the arid climate to contend with; as our altitude is high, we must plant and grow what we can make the best success of. We can grow almost all standard fruits with partial success; some thrive better than others; cherries at the head. We have not failed on cherries for the eight years past. Peaches also can be grown with good success, and pay well. Commercially as yet we have not been able to make apple growing successful, but with selected locations for apple trees, where we have drainage to the trees, so as to get the seepage from higher land, they do quite well.

In May and June cherries ripened, before hot weather set in, which was the hottest during any summer I ever saw in thirty-two years; but notwithstanding this all fruit-trees made a fine growth early in the season, owing to a wet spring. The hot, dry weather checked the growth, but the rains came in time to save the trees and fruit, although the fruit was about a month later ripening than otherwise would have been the case. There were more trees planted last spring in the sixth district than ever before in one year, and the losses were less from drought, notwithstanding the hot summer. There will be a large number of trees planted in spring of 1902, principally cherry, peach, and plum. Trees have matured well this fall, and are going into winter well matured and in good shape.

Small fruit is not a success with us. Gooseberries do well; currants have been almost a failure, excepting the native black variety, which does well. Strawberries do well where they can be watered. Blackberries have failed with me, and all over the northwest, excepting in favored places where they are well sheltered. Black raspberries do much better than blackberries. Red raspberries have been almost a failure. Grapes have done only fairly well.

Forest-trees have done well. Black and honey-locusts stood the dry weather

best on the high prairies, but all of our forest-trees have done fairly well and have added greatly to the beauty of the northwest and our homes. We can only appreciate the beauty of trees of various kinds by looking back to the time when the northwest was one vast plain, without trees which now dot the landscape with shade and beauty and produce the fruits that we enjoy. While not as abundant as in the older counties, yet those who have planted fruit-trees and taken proper care of them have plenty of fruit, such as peaches, cherries, plums, etc.; and it would surprise some of our old fruit-growers to walk into some of our good housewives' larders and see the stores of canned fruits, jellies, jams, marmalade and fruit butters there—home-made. The beautiful plants and flowers surrounding many of our homes prove that taste, as well as necessity, is the order in the lives of the "short-grass people" of the great northwest. In our locality, as well as in any other, we must labor for success, and the raising of fruit and flowers all depends on the cultivation and care given them.

#### SEVENTH DISTRICT.

GEORGE W. BAILEY (Wellington): Mine is a large district, and I have not been able to travel over it and report at this meeting. I have been over Sumner county considerably; at our street fair I had some fruit on exhibition. In the county a number of men have attained success raising apples. A gentleman by the name of Olders told me about the amount of money he received for the fruit of two trees. He told me they gathered ninety-five bushels off the two trees, which grew on Arkansas valley land. The lowland in our county along the river or creeks is excellent for apples, but not as good for peaches, although there were some that were excellent shown at our street fair. Our uplands are better for peaches than the lowlands. As to small fruits: Blackberries, raspberries and strawberries were, with few exceptions, nearly a failure; plums were not very good, but peaches and pears made a fair crop. Those who had trees bearing in our district made some money off their peaches and pears. The apple crop was one great success, I believe; we realized the best quality and best prices ever. I sold apples in an early day for two dollars a bushel; this year they sold well, and the growers made money. Sumner county is noted as much for its horticulture as for anything. As to grapes, I have raised them for twenty-seven years and never had a failure. That is one fruit the people all over our district raise continuously year after year. Unless out in the short-grass region, all raise grapes. We never had any grapes rot in Sumner county that I know of.

DOCTOR BOHRER: With regard to grapes, I have been clear out to the Colorado state line, and where men have given grapes proper attention they have produced all right, especially in the Arkansas valley. Some varieties of apples—Winesap, for example—do well on lowlands out in that district that are a failure on the high prairies. My farm is on a divide between the Arkansas river and Big Cow creek, and the Winesap seldom succeeds there, because it is so deep to water. This season Ben Davis fell badly. My trees are, however, from eighteen to twenty-five years old. In the eastern part of Rice county, on similar land, younger orchards did fairly, and the apples were larger and better developed. It occurs to me that farmers would do well to annually plant a few trees of standard varieties, thus keeping a supply of young trees on hand, and cease being dependent upon old orchards for fruit. The quantity of apples in Rice county is unprecedented. One farmer informs me he had between 12,000 and 15,000 bushels. I have only 700 trees, and probably had 2000 or 3000 bushels. Some were of fair quality. They were affected some by insects and fungus. I did not spray; it requires too much work. The cherry crop was large.

Early Richmond was the only variety that succeeded. The Early Richmonds usually bear some every year, but a large crop about every other year. The trees are in better condition than at any time within perhaps six or eight years. With regard to apples, the Ben Davis has been very satisfactory for a number of years. Smith's Cider is decidedly the most profitable winter apple on my farm; it yields fine apples every year. I have few trees, and those not in good condition. There were enough peaches for home use. There were very few peaches shipped in. I think McPherson and Sedgwick counties experienced similar conditions. Blackberries with us were a failure; my bushes were full, but they dried up after they began to turn red. I could irrigate them, but I don't believe that would have saved them. The winds were more unusually hot than I have ever seen them since 1874. This is the first season I have failed to raise celery. I planted and replanted, but the wind just simply destroyed them, and an entire failure of vegetables. I have never failed to raise lettuce in quantity, but this year I nearly failed. Turnips were a failure all over the county, because it did not rain until too late for them to grow of suitable size. When the rain did come, apples grew beyond the expectation of everybody. I believe horticulture is on the increase and feel encouraged. The rains have now wet the ground deeper than for years, and I believe everything will turn out well for us next year.

MAJOR HOLSINGER: The thought seems to prevail that small fruits were an entire failure and the prospects unfavorable. I would refer to a fine plat of strawberries on the Chandler place, the very highest point on the Kaw river, near Argentine. Mr. Chandler is present with us. I have watched his plantation with much satisfaction, and found his strawberries in good form throughout the season, and they will to-day compare favorably with any plantation I ever saw on such a high elevation. Why were failures all around while this plantation shows its remarkable condition? Simply because of cultivation. Mr. Chandler kept up a continual cultivation; and I believe that no matter how dry the season we can have good small fruits if we give them proper cultivation. My sons have ten acres of raspberries, and I have never seen any surpassing them in beauty and growth. Their blackberries are also fine; all have been cultivated, and that is the secret of the matter. I believe that with thorough cultivation we can grow fruits whether we have rain or not. One thing more in regard to strawberries. We had a phenomenal growth of strawberries the past season. We supplied water by steam power, throwing it upon the plants and keeping them well irrigated, and received good returns. I am only sorry that the boys have not followed irrigating during the remainder of the season. Their plants are not in as good condition as the Chandler plants.

MARSHALL CHANDLER: I have a small strawberry field. The only thing to which I attribute my success is cultivation; I hoed through it nine times, and never missed plowing once a week, sometimes twice. I planted them in the dust and they did n't get any rain. I used the weeder and a seven-tooth and fourteen-tooth cultivator; it is cultivation that does the business. I would find it moist as long as we would cultivate.

W. D. CELLAR: Major Holsinger is always harping on cultivation. Cultivation alone, Mr. President, would not, last year, in all cases save strawberries. I have a neighbor who is as honest and thorough a cultivator as any in Kansas. He almost lived in his strawberry patch. There was not a weed in it, and the ground was as mellow as it could be up to the time of the drought. The nature of the soil was such that the plants absolutely burned up in spite of cultivation. You have got to have the right location and the right soil along with cultivation.

E. J. HOLMAN: That is right; if it was not I would have a better prospect for a strawberry crop next year than I now have.

B. F. SMITH: I cultivated one patch seventeen times, and did n't get enough fruit off of it to pay for the mulching, and I had as fine a crop of vines as I ever saw. My trouble was that I subsoiled the year before. On another patch which, on account of the nature of the subsoil, I could not plow over four or five inches deep, I had my best strawberries. There were three acres, and I put them in in the very best condition. I never before set plants out when the ground was in as fine condition; but I did n't get enough off of those three acres to pay for the mulching. We had three months and ten days without enough rain to lay the dust; and for thirty-three days the thermometer registered from 100 to 112 degrees.

C. W. MURTFELDT: I come from St. Louis, and I value my membership in this association very highly. I have had my name on your roll and met with you, off and on, for thirty years. Major Holsinger, in advocating plowing and thorough culture in Missouri, stated, "You should mix it with a strong dose of good common sense." He failed to mention that here; but I will emphasize that you should do that. My friend Smith here undervalues subsoiling and thorough cultivation because it happened to fail with him. Long years of experience show that perhaps next year, through the cultivation he is now complaining of, he will have a good crop, and then he will take the other side of the question when he comes before you.

F. W. DIXON: I have had strawberries under all the conditions mentioned, on the same farm. We had some light, sandy soil and upland, and from that to the very richest bottom land, and on what we thought was the best bottom we had the poorest berries. The best berries we have are on very heavy soil, and when the last rain in spring came the soil was wet, and I did not wish to wait for it to dry; so I put teams enough on to work it dry, and that land grew the best strawberries on the place; the next best were on very high upland that was plowed in the fall and was not worked while wet. On the soil we worked wet the strawberries did better. We planted ten acres in March that were pretty good. The white grubs worked some, but only where the soil was loose.

EDWIN SNYDER: There is no sense in subsoiling, because if the ground needs any pulverizing below frost does it. The only salvation from dry weather is surface cultivation. I raised good peaches this year on ground cultivated thoroughly for several years.

DOCTOR BOHRER: I have talked with a number of fruit-growers regarding surface or shallow cultivation, and they say it is of double character—two objects are to be accomplished. One is to keep down weeds and prevent the fertility and moisture of the soil from being divided between weeds and crops. The other is to serve as a surface mulch.

J. W. ROBISON: It is a fact that different men have different experiences with subsoiling. We know that those who cultivate attain different results; that is not strange. It is often because of a difference in the soil. About a dozen of my neighbors bought regular subsoil plows that went down from one and a half to three feet. Some using eight horses on them, thus working their ground up. Not a single acre of their ground produced as good a crop as it would without even ordinary plowing. In my own experience, I paid two dollars an acre to have land plowed thirteen inches deep with an ordinary plow. We did n't get over the entire field in that way, and the balance was turned over the ordinary depth. That deeply plowed land has never produced any better crops than land alongside of it plowed only four to six inches deep. Success or failure

depends entirely on the condition and elements of the soil. Some soils would be benefited by subsoiling, but the majority of Kansas soil is, below six inches, in better shape for plant growth without subsoiling or disturbing in any way. And why? Because the prairie-grasses of Kansas have been subsoiling it for centuries; your plants root deeper than you can subsoil; and when you put the subsoiler in you close all the veins for draining water off, and they will stay closed until new plant roots grow down and decay and leave new passages. Many of the insects in the ground go up and down and leave their channels through, summer and winter. That land I plowed thirteen inches deep showed no different results for some years. This year it was in alfalfa, last year in wheat. It was plowed the ordinary depth, harrowed across twice, packed with an Ohio packer, and sown to alfalfa. Any person could see a line of demarkation between that deep plowing and the other plowing. It was all a good stand. But the subsoiled land took double the work and attention that we ordinarily put on ground. Alfalfa grows about three times as fast downward as it does upward, and in a month the roots would be at the bottom of any subsoiling you could do. With favorable rains it would do that, but it will never grow well until it strikes bottom, because there is where the moisture lies. Our experience in Butler county has convinced us that subsoiling is worse than stirring the surface only. It produces neither more nor better crops, and it is certainly far more expensive. I know of no man in that county who subsoiled the second year.

EDWIN TAYLOR: This shows the danger that agricultural and horticultural people fall into, especially those who dictate or write in books and papers. They allow their philosophizing to precede their observation, and I am in favor of having an act introduced into the next legislature making it an offense, punishable by fine and imprisonment, for any man to ever publish or connive at the publishing of anything which would tend to establish agricultural or horticultural practices of any kind on any other basis whatever than observation confirmed by the balance-sheet. My friends, I am tired of this. How did we come to buy all these subsoil plows? I have a good one. It will go three feet deep—if you furnish the power to pull it. I got it because I read in a book and in a half-dozen different papers that if I would break up the ground away down yonder it would get full of water, and water would stay there, and on account of this, that and the other thing it would be much better. Here come the gentlemen who have tried it—I won't say anything about my own trial—but these gentlemen have tried it and say it is not so, and they bring up their books to show it. That is the end of the controversy. There is no prophet that speaks with such authority as profit. If it is not profitable, then there is n't anything in it. If it is not profitable, then the fellows who recommended it on account of their philosophy ought to be made responsible for the loss. I did n't go into subsoiling but about eighteen inches deep. I never could tell from the crop where I began nor where I left off. I recollect, when I was a boy up in Michigan, the deep-plowing business was being discussed in the *Tribune*. We lived on the New York *Tribune* then. Every week the *Tribune* had something about deep plowing. I told father that we were missing something big. Father said for me to go ahead and break up a piece of ground that way. I did n't do a thing but put four horses on a plow that would go down about a foot deep. Well—when I went up there the last time, a short time ago, I inquired about that field, and they told me that it never from that day has raised as good a crop as it used to raise. I had just ruined it. The subsoil does not belong on the surface and never did. [This is trench plowing.] The people who talk about subsoil or deep plowing for ordinary soil are talking about something they know nothing about. They have allowed their philosophy to get ahead of their observation. It is a dangerous thing to do, and they should be held responsible for it.

## HOW CAN WE GIVE APPLES THE BEST COLOR?

A MEMBER: Let them hang a little late. Don't pick too early. My experience has been to let the apples hang a little longer than usual. I believe apples should hang until they are fully colored—it improves the flavor and marketable qualities. This year, on account of late rains, our apples took a new growth and did not color well, and we had to let them hang pretty late to get colored. If we allow them to hang to the proper time they should be picked, nature will color them.

A MEMBER: Do n't the higher apples color earlier than the lower ones?

A MEMBER: Yes, but not much. We cannot leave them too long to get both color and flavor. They will then sell for fancy prices because they look good. Looks have a great deal to do with the sale of apples.

A. E. DICKINSON: In 1897 we had a hot and dry October. Our apples did not color well. A few of our neighbors left their apples until November, until frost, and they colored up beautifully. About three weeks, or probably a couple of weeks after I was through picking, those that were left on the trees were beautifully colored. It also requires dampness, and the finest color I ever saw in my orchard came when the frost on them was melted by the sun. I question whether it would not benefit, in dry, hot seasons, to spray them a little. I know no other artificial means of coloring apples—if that might succeed. I simply suggest this because I observe that it requires dampness as a necessary feature in coloring apples. Chilliness is another feature essential. Sometimes apples color of a peculiar red, different from usual, which I have thought due to the presence of iron in the soil. I remember selling one year to a gentlemen from New York, I think, and he looked at my fruit and said he had never seen Ben Davis apples colored like mine. The Missouri Pippins this year are very beautiful in color.

WALTER WELLHOUSE: I believe with Mr. Dickinson that moisture and chilly nights have more to do with coloring apples than anything else. We have picked apples when there was no rain for a month before picking, and they were a very dull red; while other seasons, with rain and cool, chilly nights, they colored up nicely.

W. E. RINGLE: This subject of moisture and coolness being connected with the coloring of fruits is very interesting to me. But I don't see the connection this moisture on the fruit would have with the coloring of it, unless in this way: Scientific investigators have shown that chemicals, an acid or an alkali, when brought into contact with the roots of a plant, will color the fruit. We can demonstrate that in the laboratory with house plants and flowers. Moisture on the ground at a particular time may dissolve certain properties in the soil which, when taken into the circulation of the plant at that particular time, may affect the coloring of the plant. That is the only connection I can see.

MR. DICKINSON: My first observation was, I think, in 1895; we had three very stiff frosts on successive nights. The apples were not previously well colored, but in two days after those frosty nights the apples were colored beautifully. The sun came out and melted the frost, and the apples were colored. I cannot explain the philosophy of it, but it is a fact.

MAJOR HOLSINGER: Grapes around Kansas City were ripening very unevenly, so that we thought that hail had injured them, and that it was useless to try to market them. Fully one-third of the grapes were green, when others were colored. It was necessary to pick out the green ones in order to market the others.

What happened? We had a frost one night, and two days after the grapes were black. This was over a very wide area; that frost seemed to have some influence upon those grapes, so that in two days they were ready for market without picking off any green grapes.

J. W. ROBISON: The theory of moisture don't seem to hitch exactly with nature. Out in the Greeley apple district in Colorado, this year, they have the finest colored apples that I ever saw and there was not a particle of moisture there. On high altitudes, in dry countries, they always color better than they do on lower levels. It seems to me the color must come from the sunlight. Frost, no doubt aided by the sun, does it. It cannot be that the roots of the tree bring coloring matter up.

G. W. BAILEY: In apples that are naturally inclined to color, I think that anything that will hasten their maturity will heighten the color. Frost hastens the maturity of fruit, just as it did the grapes Mr. Holsinger spoke about. Sunshine, or anything that will hasten maturity, will, in my judgment, hasten and heighten color.

### CANKER-WORMS ON ELM TREES.

*Query:* "A party having a park of some 5000 forest-trees complains of canker-worms and wishes to know how to prevent their ravages. They eat the foliage, particularly of the elm and hackberry."

JAMES SHARPE: The same remedies that will destroy them on fruit-trees will also destroy them on the elm and hackberry. A poison spray on the foliage will destroy them.

J. J. ALEXANDER: The park association at Norton requested me to bring that question before this meeting. Those elm trees are too large to spray, and, when we notice the worms on the foliage, it is too late to spray and kill them. The worms commence to eat when the leaves are very small, and if there is no method to stop the female from laying her eggs that make the worms, I think we are at a loss what to do.

J. W. ROBISON: In New Haven they have probably some of the finest elms in the world, and no community is more proud of anything than New Haven is of her elms along the streets. They went to great expense and labor to protect these elms from canker-worms, but nothing seemed successful. They even imported the sparrow, and I do n't know which is the greater nuisance to-day. I tried a method which was partially successful on apple trees, and that is to paint with pine tar. The work must be done in early spring, say some time in February. The female comes out of the ground and starts up the tree in late winter, and, going up, finds a suitable place to lay eggs. We took tar and painted a ring around the body of the tree. The canker moth would go up, get her feet smeared with tar, and drop off. I even dug the earth away from the base of the tree and filled the space with water, and on cold nights it froze, and we frequently found a quart or two of the moths frozen in the ice. It was much like thinning apples—it was just thinning to give others a chance. A leaf would fall on the tar and make a bridge across it, and the moth procession went on up the tree across that bridge; not so many, of course, but numbers of them. The tar will only remain about a week, when it must be renewed, but it does not take long. The tar must not be used on young trees, or, at least, the younger the tree the less tar should be used, because there will be no growth above where you put the tar; but the tar can be taken off very easily.

**MAJOR HOLSINGER:** While in Buffalo I noticed that the canker-worm had attacked many trees throughout the city, and I observed there that the trees were protected in many locations by bandages of cotton batting, and those trees that were thus treated seemed to be free from the visitation of the canker-worm. This method seemed to be very effective. Two years ago, in our town, we had another insect that was like a very large moth, and the worm was as large as my finger—a great, green, monstrous, hideous-looking worm. A great many people immediately went to wrapping cotton around their trees, but it seemed to offer no obstruction to this worm. But I believe the plan will work with what is commonly called the canker-worm.

The Society adjourned.

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### FIRST DAY—Evening Session.

THURSDAY EVENING, December 26, 1901.

The Society was called to order at 7:30 o'clock by President Wellhouse.

Frank Peacock, president of the Shawnee County Horticultural Society, delivered the following

#### ADDRESS OF WELCOME.

Mr. President, Ladies and Gentlemen, Members of the State Horticultural Society: I extend to you the hearty welcome of the local horticultural society. Horticulturists that live in and about Topeka have very good reason to welcome the State Society, as every year they are enabled, without traveling far from home, to listen to the wisdom of long experience from persons who have spent their lives growing fruit in Kansas; and I am sure the Shawnee County Horticultural Society fully appreciates such advantage, too. Everybody who has had trees has had fruit this year. There has been some hail that damaged the apples in a few instances, but nearly all the orchards here, as elsewhere in Kansas, had good crops. Another good thing about it is that every one has been able to get good prices for their crops, which always makes a very happy combination. The planting continues here in this county, and each year more trees and vines come into bearing. I think perhaps our great drawback is that we can raise fruit with too little effort, which perhaps makes us a little careless and somewhat lazy, and we do not get as good returns as we would if we put forth more effort. However, the work of education is going on all the time, and, with what we hear at the State Horticultural Society, and what we read, and what experience we gather in our work, probably we will have far better results in the future than in the past. Again, on behalf of the Shawnee County Horticultural Society, I welcome you to Topeka.

#### RESPONSE BY MAJOR HOLSINGER.

Mr. President, Ladies, and Gentlemen: It is with gratitude that I accept on behalf of the State Society, the welcome extended us this evening. I am glad I am a member of the Kansas State Horticultural Society. I am glad to be a member of the grandest profession that was ever instituted in this world—the growing of fruits and flowers. I commenced along this line as early as 1858, in the state of Kansas. I was possibly one of the earliest to grow a nursery in the state, locating, as I did, near Lawrence, at a time when it was supposed to be impossible to grow fruit in this state. At that time the individual that dared to think of growing apples, peaches, plums, cherries and other small fruits in Kansas was considered as unbalanced, and this notwithstanding the strawberry grew everywhere over our prairies. I saw the strawberry grow so universally



along the old Santa Fe trail, from Kansas City to 110-mile Creek, that you could not step off the trail into the prairie-grass without crushing the luscious fruit; and yet the people thought fruit could not be grown in Kansas. I saw wagons from Topeka and other Kansas towns going over into Missouri to bring back various kinds of apples for which Missouri was famed, because they thought apples would not grow in Kansas. What is the situation now? Apples grow and continue to grow, until they reach the western horizon; and we find the further west we go the finer the quality. We can and do grow splendid fruits in Kansas. Has fruit-growing been a success? It surely has. I see before me persons better off, financially and in other ways, from luscious fruits, in the production of which Kansas bears so conspicuous a place, having taken medals in all contests where she has contended for prizes.

We are here for the purpose of getting information, and of informing you, as well as we may, as to the varieties of fruits that are, may or can be raised in the state. I hope the day may come when Kansas will be the equal of Missouri, Illinois, or New York, the three states which now stand foremost on the list as fruit producers. Kansas should not be second in anything. I attended the Missouri state meeting the other day, and they had the finest show of fruit I ever saw, and the most enthusiastic meeting I ever attended. Over 1200 plates of fruit were on exhibition. Of the many varieties of fruit to plant that seem especially adapted to Kansas, there is no end. It seems that Kansas is adapted to all fruits, from the earliest strawberry to the latest apple. But I must close this rambling talk of mine by illustrating the estimation in which Kansas is held over in Missouri. The morning before their adjournment, I was sitting at table with three Missouri drummers, two of whom, knowing I was a Kansan, were prone to poke fun at our state. After several flings at Kansas, the third man said: "Well, I am a Missouri drummer and live here in this town. I canvass Missouri and Kansas; but I sell four times as many goods in Kansas as I do in Missouri." The others wanted to know how he accounted for that. He said: "Gentlemen, I tell you Kansas has more of more than any other state in the union." "What do you mean by 'more of more'?" they asked. "I mean just what I say," he said. "When Kansas has wheat she has more wheat; when she has corn she has more corn; when she has hogs she has more hogs; when she has potatoes she has more potatoes; when she has wind she has more wind; and when she has cranks she has more cranks than all of the states in the union." I took it as a compliment. I thought Kansas was n't a bad state after all, and believed that possibly he spoke true.

On behalf of the State Horticultural Society, I gladly accept the kind welcome extended to us, and thank the Shawnee county society, through its representative and President Peacock, for the hearty good will expressed here to night.

#### DISPOSITION OF CULL APPLES.

By FRED. WELLHOUSE, President.

Just what to do with our culls, has been with us a chronic disease of long standing. Many years before our trees bore fruit we were worrying about how to dispose of cull apples. And during these cogitations, one of the indispensables always prominent in our thoughts was a large cider-mill, for converting our inferior fruit into a merchantable commodity; hence in 1881, when our trees produced their second crop, we bought a Boomer & Boschert cider-mill, with the necessary power and appurtenances required to run off a car-load of cider in ten hours. This mill we started at once working up all our culls and many for the

neighbors; meanwhile we were selling all the sweet cider we could; but at the end of the season many barrels were yet unsold; by the next season this had turned to vinegar and was put upon the market. The following year we procured vats, shavings, and such other things as were needed to rapidly convert cider into vinegar and during that year all the unsold cider was put into vats and converted into vinegar; about this time we were getting a faint idea that we were acquiring experience. The leakage of vats and barrels, the bursting of hoops and the constant evaporation were daily lessening our stock, and by the end of the year we had concluded that converting apples into cider with the expectation of making money out of it was an uncertain road to travel.

The next year we received circulars giving glowing accounts of the wonderful performances of the Plummer evaporator; we also received a call from Mr. Plummer in person, and, as the cider-mill as a money-maker diminished in importance in our mind, the Plummer evaporator began to "loom up"; and Mr. Plummer soon convinced us that if we had one of his mammoth evaporators the road to wealth was easy, and of course we ordered one, although the price was high. In about two years we had more experience. Ah, these experiences! They are precious things; and a man who does not experience a few never amounts to much. I do not want it understood that I am saying one word against the Boomer & Boschert cider-mill or Plummer's evaporator; in fact, each performed its work well, and all it was recommended to do, and in the hands of experts no doubt would have been profitable. But at the end of two years, when our books were balanced, we found that the manufactured products only brought us about what the culls would have sold for in the market; thus losing our labor, wear and tear of machinery, etc. Since this experience, we have had very decided opinions as to what ought to be done with *our* culls, and, as they were picked, we have sold them to whomsoever would give us the most cash. Another thing we discovered about this time, and that was that all our time was needed in caring for our orchards, gathering the fruit and getting it to market, fighting rabbits, borers, tent-caterpillars, canker-worms, fall web-worms, codling-moths and other insects that love the apple as well as ourselves, and were contending with us for its possession.

Another problem also faced us at this time, and that was how we should obtain the right kind of help to gather our fruit; there are at times a good deal of it, and when we need it we need it bad, and in order to have our work done rightly we need the *best* help we can find; and to secure this kind of help we have always found it necessary to pay good wages, and during the past twenty-five years we have invariably paid \$1.50 per day for ten hours, or fifteen cents per hour; and when a man was incapable of earning this amount we gave him his time. This was from twenty-five to fifty cents more per day than customary wages; and often we could have secured good help at lower wages, but thought it good business to stick to our regular prices. This has enabled us to get plenty of help at critical times, when the work had to be done immediately, and also to get men who, by helping us year after year, had become skilled in the work; and now, when we have a job of work on hand, we at once employ as many men as we can work to advantage, and when the work at hand is completed we pay all off. We keep no help the year round except a foreman.

The selection of the right kind of tools and implements to gather and place the fruit in market economically had also to be attended to, and the following is a description of those we employ: We use two ordinary farm wagons, with front wheels twenty-four inches and hind wheels thirty inches high. These wheels are of steel, with cast-iron hubs, and very cheap and durable. On each of these

is built a platform fifty inches wide and sixteen feet long, made of two-inch pine or cypress lumber; on the side and ends of these platforms we spike two-by-four joists to hold the boxes in. These platforms are just above the hind wheels and just high enough in front for the front wheels to turn under. This brings the platform to an easy height for the men to empty the fruit into the boxes set thereon. Next we make 100 boxes twenty-four inches long, eight inches deep, and sixteen inches wide. The ends are of seven-eighths- and the sides of three-eighths-inch lumber, of any light-kind that will hold nails good; elm or cottonwood will do. We obtain these boxes from a box factory, ready to nail together, with handholds cut in either end, at about fourteen cents each. They hold from fifty to sixty pounds of apples each. Each wagon platform holds twenty-two of these boxes.

Next comes the sack or basket in which to put the fruit while picking; we have tried everything that came in our way, but settled on the old seamless sack with a bottom and top corner fastened together with a hook and eye. The essentials for a good receptacle to hold apples, while picking, are: First, one that will cause the least amount of bruising; second, one that can be readily fastened to the body of the picker and allow both arms perfect freedom; third, one that can be easily emptied into the boxes on the wagon with the minimum amount of bruising; fourth, one that is durable and not expensive. Next, we procure from four to six ladders twelve to sixteen feet long, thirty inches wide at the bottom, and six inches at the top. This, I believe, completes our outfit for field-work. We now hitch a team to each wagon and drive to the field with twenty-two boxes on each wagon, and with, say, from ten to fifteen pickers and a foreman. We drive one team between two rows. The foreman's business is to keep the team up even with the pickers; see that the men do not huddle up and interfere with each other; see that they do not get too far away from the wagon; see that they do their work correctly; and to keep the time of the men. When the wagon is loaded, it is driven to the packing-house and the other wagon takes its place. Our men pick all the way from thirty to seventy-five bushels each per day. Our trees are headed so low that five-sixths or more of the fruit is picked from the ground. Last year, on a block of 270 acres of six-year-old trees, our men averaged seventy-one bushels each per day during the entire season.

We pick our apples, large and small, good and bad, clean from the trees at one picking, and do all sorting at the packing-houses; we have tried sorting direct from the trees, but it never gave satisfaction and we always had to sort again. Sorting is the most particular work we have to do and requires great care in selecting careful help for this purpose. Women often make excellent sorters, but we have never had success with boys or girls, either in the field or in the packing-house. Young farmers, from twenty to forty years of age, used to hard work, have given us the best results as pickers, but most of our best sorters we get from town. Our outfit for sorting and packing is a platform or floor 16x32 feet, with a table along one side four feet wide and thirty inches high, two dozen one-half bushel baskets, three or four light hatchets, two barrel presses, plenty of barrels, liners, and nails. Our platforms are sometimes made in sections, so that we can move them to any part of the orchard. The wagon-load of apples from the orchard is driven up to the table and the full boxes removed to the tables and empty ones placed on the wagon and returned to the orchard for another load.

The sorting is done from these boxes while on the table. First grade are put in barrels; second grade are hauled in wagons and loaded into cars in bulk; third grade are carried to a pile. Our first grade embraces all sound apples

above two and one-quarter inches in diameter; second grade, all above one and one-half inches that are not badly damaged; third grade, all below one and one-half inches, and all those of that size that are badly injured. This grade we sell to the neighbors at ten cents per hundred, or five cents per bushel, and they load them into their wagons from the pile. This grade is of too little value to bear the cost of shipping, and must be sold at home, and at five cents per bushel we have little trouble selling them. The second grade we nearly always sell in bulk in car-load lots; they usually go to localities where apples are scarce. Last year we sold seven car-loads to one firm for sixty cents per hundred, who shipped them to small towns in Nebraska, and sold readily at a good profit. Twenty years ago railroad rates were so high that there was almost an embargo on this class of apples. We then paid as high as \$1.10 per hundred to Denver; now we get rates for one third that amount. Last year we sold two car-loads to a Topeka canning factory for forty cents per hundred. This, I believe, is the first we have sold to the canneries, but we expect to sell largely to them this year. The highest price we ever received for these culls was sixty cents per hundred pounds, and the average for twenty years has been a little over thirty-six cents per hundred, or eighteen cents per bushel, f. o. b. cars here.

We had trouble at first in loading cars in bulk. The railroad requires a minimum of 24,000 pounds, and to get that amount in we had to pile them three or more feet deep, and this required the men getting onto the apples with their feet, which bruised them badly. We finally arranged a sliding door or partition the width of the car and three feet high, set at an angle, with braces to hold it in place. This door we placed near the end of the car and piled the apples in behind, and when filled to the proper depth the door was pulled forward; this enabled us to fill the car with a minimum amount of bruising. The demand for this class of apples is constantly increasing. The lowering of rates on the railroad has had much to do with this. In 1890 we sold our entire crop of culls to two New York firms, at forty cents per 100, and they put up kilns in the orchard and dried them. These kilns are so simple and so efficient that I take the liberty of describing them. They erected a cheap building, eighteen feet wide and thirty-six feet long, and two stories high, divided into two rooms below and two above; these rooms were each eighteen feet square, and the only floor was eight or ten feet from the ground, and was made of slats one and one-half inches wide and one inch thick, beveled on the lower edge; these slats are laid so as to leave a crack one-eighth of an inch wide on top and one-half inch on the under side. The prepared fruit from 100 bushels of apples is put in each room on these floors. Large stoves or furnaces in the lower rooms raise the temperature to about 150 degrees; and by having ventilators below and above, the hot air is carried up through the fruit, and by turning or shoveling it over once or twice the fruit is dried in about twenty-four hours.

After those parties were through drying we bought their kilns and added three more, thus making their capacity 500 bushels per day. We never have time to use these kilns ourselves, but have often sold our culls and allowed the purchaser to dry them in our kilns. This enabled us at times to make good sales. A ton of coal will dry about 125 bushels in these kilns. Three women, with one paring-machine, will pare, core and trim fifty to seventy bushels ready for the slicer and dryer. Each 100 pounds of apples yields about ten pounds of dried fruit, and about ten pounds of dried parings and cores. The prices for dried fruit have ranged from five to fourteen cents per pound; parings and cores, from one and one-half to three cents per pound.

## THE CULTURE OF FLOWERS.

By MRS. G. W. MAFFET, of Lawrence.

The program announces "The Culture of Flowers" in a way that might suggest a paper full of sentiment, poetry, and well-rounded sentences, composed of high-sounding words found in Webster but not much used by ordinary horticulturists; while I distinctly understood from the secretary that it was a report on flowers new and old that was wanted. I am not sure that this body cares to know anything more about flowers than its members already know. Perhaps flowers do not belong to horticulture; but be that as it may, men like flowers; yes, they enjoy them on the dining table, through the house, and in the yard. They have at least a secondary interest in flowers. Many an old, gray-haired man has, hidden away among his papers, a pressed blossom that reminds him of a fair face and the days of his youth—only a little, faded flower, but sacred because of the hand that touched it.

Men sometimes prepare the beds in which to plant the flowers, but it is the women who care for them, plant them, water them, gather them. Nevertheless flowers is my subject, and I have prepared to take the secretary's idea of a report because it seemed more practical, and what will be said is the experience in her own home and yard of a practical woman. The subject will be considered under two heads—outdoor culture and indoor culture. Nearly every home has a bay or flower window or an ordinary window with southern exposure. A bay window is fit for nothing but flowers, and if it is not used for this purpose it is a very unsightly addition to a room, from my point of view. We will suppose you each have the necessary sunshiny window and that you want a few plants for pleasure and for making the home more cheerful.

December plants are many, if you have plenty of sunshine. There are fine varieties of geraniums, heliotrope, and flowering bulbs. Where there is not much sunshine the Christmas cactus is a very satisfactory flower to cultivate. The plant itself is a pleasing one the whole year round, one variety blooming in November, the other just now in bud and bloom. The blossom is a thing of beauty. Chinese primroses, oxalis (white, red, and yellow), and all the varieties of begonias; especially are these latter suitable for shady windows. The nicotina makes a pretty, fragrant window plant. Chrysanthemums in endless varieties are showy flowers, and only ask for a cool place with plenty of water.

Many of the aforesaid plants will bloom all through January. The single hyacinths can be potted so as to bloom for several months, by bringing the potted bulbs to the light at different periods. Cyclamen is a very satisfactory plant for house culture, and Chinese primroses give constant pleasure. For February, petunias and nasturtiums that have been potted in the fall will repay for their trouble, if only given plenty of sunshine and water. These are favorite flowers either indoors or outdoors. There is a new variety of the latter, called Baby nasturtium, that is attracting attention among the lovers of this flower. I'd rather have a bed of this flower in my garden than any other I can now think of, for if the blossoms are plucked regularly they will bloom continuously until nipped by Jack Frost, and if you are quicker than he, and get a few roots potted, you will have flowers through the winter.

In March "a daffodil awoke and asked the season of a passing bird. The maples crimped their knots of fringe the pussy-willows came at call." This is the month that daffodils, tulips, crocuses, violets, hyacinths and anemones show their heads; but do not be in a hurry about uncovering them. This is the month,

if possible, to prepare the bed and sow the sweet-pea seed. Some one in Sedgwick county, Kansas, has had great success, even during the hot months, with this beautiful flower, by planting in trenches between the rows of the garden peas, covering lightly at first, and filling the trenches as they grow, giving them brush to climb and hoeing as one does the garden peas. It is necessary to pick the blossoms of the sweet pea every day, if you wish blossoms.

April showers bring May flowers. The very first days of this month the school children begin to hunt for the dog-toothed violets. In this climate it is time to sow seeds of annuals and clean out the beds of perennials. If we were women of leisure much pleasure might be derived from planting largely the annuals; but I am more and more convinced every year that a woman who acts in every capacity from dishwasher to club and church worker had better plant hardy flowering plants, shrubs, and climbers. These, with a few house plants for home decoration, will be as much as she should care for. A good plan is to have a few beds in the kitchen garden, so as to have flowers with which to supply the table. A bed each of nasturtiums, phlox, hardy, old-fashioned pinks and cosmos will supply flowers until late fall.

Every one should have a variety of roses, lilac, snowball, spirea, rose of Sharon, peonies, bleeding heart or dicentra, syringa, deutzia, and many more, if you have place for them in the full open sunshine, that will give pleasure and take less work than the annuals. None of these can be expected to do well in shaded locations.

The soap-plant or yucca, that is so common on the prairies of southern and western Kansas, should have a place. A hedge of yucca along a walk or driveway is a beauty when in bloom, and a joy forever, because it is always green.

Among the climbers, the Crimson Rambler makes a quick growth and is the most gorgeous bloomer I've ever seen. The clematis, particularly the purple, is a pleasing sight when in bloom, and continues flowering until late in the fall. I came across a new climber—new to me—this summer. The nearest name that answers to its description that I could find is *Solanum jasminoides*. Planted in April, it covered the whole of a south porch, growing fifteen feet high, and was full of bloom from June until the hard frost of the last of November caught it full of blossoms. The flower resembles somewhat the blossom of the potato—light lavender with yellow center. Some of you may be familiar with it. I am sure if one had a place that needed to be covered with a quick-growing vine, combining foliage and blossoms, this would be a good one.

The month of April is bulb-planting time usually. Dahlias and gladioli are the ones I used to spend time with, but now the Russian sunflower, that does not need to be taken up only when the plants need thinning, is in their stead. These are as pretty as dahlias, in one color only—yellow—and much less trouble. These are my house-decorating flowers after everything else is gone in late fall, only nasturtiums and old-fashioned pinks keeping them company.

May is the month of tulips, violets, lilacs, and I must mention the wild crab-apple. We have on our creek a number of the wild crab trees that blossom profusely, and woe to the one who dares destroy them. In delicateness of color and perfume the wild crab heads the list of wild blossoms. Many home flower-keepers begin to put their house plants out in May. I tried doing so for a few years, but now mine are only put out on the porch for a refreshing rain; hence, I never have the trial of dropping leaves or withered plants, and our bay window does n't look lonely.

June is called the month of roses, but in this climate many times the prettiest

roses are gone before Decoration day. The American Beauty is all the rage, and the latest fad in carrying or wearing these is to have very long stems.

Through July and August enjoy the flowers that bloom and give them plenty of water to insure blossoms.

September is the month to plant bulbs for winter blooming in the house, and in this month and October is a good time to prepare the beds and plant tulips, crocuses and hyacinths for an early spring display. Last November was a remarkably pleasant month, many of the plants blooming out-of-doors until after the middle of the month.

Flowers require care, but they add so much pleasure to our lives, whether we have them in the house or in the garden. There is no home but that at this time of the year will look more cheerful if an umbrella plant, a fern, an air plant or a palm is found somewhere in the house. Umbrella plants and ferns are so easily cared for and need so little sunshine that a corner can be given them anywhere. Keep the umbrella plant in a jardiniere of water to prevent the tips from turning yellow. I keep some pretty century-plants in my dining-room through the winter which give a sort of tropical air to the room and are not easily affected by the cold. Do n't think, because you cannot have a small greenhouse or a fine bay window, that you will not keep plants; and do not keep so many that they become burdensome, but have a few to add cheerfulness—a little green when everything is brown and bare outside. Keep a few suitable ones, and they will prove as messengers given to gladden the heart and point to heaven.

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#### WINDOW AND HOUSE PLANTS.

By W. A. HARSHBARGER, of Topeka.

The topic assigned me, "Window and House Plants for Winter Decoration," is one on which much has been written. Many books written by experts and dealing with the general subject, or some special branch of it, are on the market, and numerous floral magazines giving the new developments appear regularly. I cannot hope in a paper of this character to present anything new, nor can I even hope to put the old wine into entirely new bottles. I shall treat the subject from the standpoint of the busy person who makes the window garden a means of relaxation from the treadmill of daily routine. In the few cultural directions presented, I shall give the methods which have proved most satisfactory to me.

Apart from the ethical value of a love for the beautiful, there is a liberal education in the successful cultivation of plants. No one can bring a plant to a high state of perfection without coming into close communion with nature, and intelligently working in harmony with her laws. There is a language of flowers deeper than the one we studied when the whole world loved us because we were lovers. It is the language by which the plant makes known its needs and its possibilities. To successfully master this language we must use all our powers of observation. Herein lies much of the value of amateur flower-growing. We must observe, reflect, and experiment. We should read the literature of the subject, but should never slavishly follow the advice given, no matter how good. In short, we must be intelligent co-workers with nature.

The first question that confronts the beginner is, What shall I grow? This can be answered only provisionally. There are a great many plants suitable for the window garden from which to select. Do not try too many kinds at a time. Choose a few suitable to the windows in which they are to live;

learn to manage these, and then add from time to time new varieties that seem desirable; learn to know the habits and requirements of each individual plant in the window, and meet these conditions in a systematic way. Retain those plants that give satisfaction and discard those that demand conditions that cannot be provided. What is grown is not nearly so important as how it is grown. A common petunia in a healthy growing and blooming condition is far more ornamental than a rare exotic that must struggle for mere existence under uncongenial conditions. Later on we shall speak of some varieties suited to different windows, and for the present shall consider the essentials for all plants, such as preparation of soil, potting, etc.

Good potting soil is not difficult to prepare, and it is an essential to success in plant-growing. Different plants require different soils, but the basic elements are the same. Good loam, leaf-mold, and sand, in proper proportions, will form a congenial soil for all ordinary plants. My plan is to have rotted sod, leaf-mold, sand and well-decayed cow manure separate, and to mix from these for each class of plants. Such mixtures are loose and friable, full of decaying vegetable matter. It is vastly different from ordinary dirt. Instead of sand I have used finely sifted coal ashes, and the result has been entirely satisfactory, with the one exception that coal ashes are not so cleanly as sand. For fertilizer I use pure bone-meal, and experience has taught me to use it conservatively. A pint of bone-meal thoroughly mixed with a bushel of the above soil will be safe and, for most purposes, sufficient.

Now that the soil is prepared we are ready for potting. Use clean pots, either new ones, or old ones that have been thoroughly washed. The custom that is somewhat common even among florists, of using the pots over and over without washing them, does not commend itself to me. For drainage and ventilation the pot should be porous, and this it cannot be if it is relegated to the ranks of the unwashed. In every case too large a pot is to be avoided. A plant grown in the garden has unlimited root room, but it has in addition other conditions, such as drainage, ventilation, etc., that cannot be provided in a house. Good drainage is an absolute essential. All water not needed by the plant must pass off quickly, or the soil will become sour, soggy, and infested with earthworms. In such soil the plant soon becomes sickly. Drainage is effected by making the soil porous, so it will not hold too much water, and by keeping open the hole in the bottom of the pot. A good plan is to place in the pot a layer of lumps of charcoal, and to cover this lightly with moss; this not only prevents clogging but also keeps the soil from washing out through the hole, and is thus a great aid to cleanliness.

After the plants are potted the next step is to properly house them, and this is frequently a serious consideration, for few of us are so fortunate as to possess greenhouses. We must take the windows generally as we find them, and adapt the plants to them. Usually the range of temperature is wide, and the atmosphere rather dry and dusty, and not infrequently the light is not satisfactory. All of these points must be considered in selecting the varieties to be grown. My plants are grown in a south bay window that receives the direct sunlight all day, and is altogether too airy in cold weather. It is in a south room, and the heat is supplied by a base-burner situated in the room north of it, the two rooms being connected by a large, open doorway. The floor is covered with oilcloth, so that plants can be sprayed without injury to carpets. My shelves are on a level with the window-sill. This, in my judgment, is not the best arrangement. I would much prefer to have the tops of the pots on a level with or a trifle below the sill. In the fall and spring, the hot sun shining through the glass onto the



pots so heats them that the outer roots are sometimes killed and the soil becomes baked. To avoid this I am compelled to provide artificial shade for the pots.

After the plants are established in the windows the chief work is watering, spraying, guarding against insect pests, and occasional repotting. If the soil has been properly prepared and the drainage is good, water can be applied quite freely without detriment, but experience should be our guide. Some plants require an amount of water that would be fatal to others. The greatest evil in watering is the tendency to neglect the plants for a time, followed by an effort to compensate by drowning them. This can hardly fail to work permanent injury. In cloudy weather and on very cold days water should be sparingly applied, and it is never well to apply it late in the day. Spraying is also very important and should be carefully attended to. In the dry, dusty air of a living-room the foliage will not remain healthy unless it is frequently cleansed. Spraying should be done on bright days, and early enough in the day for the foliage to dry before night. The under surface of the leaves should be reached as thoroughly as possible, both to keep the pores open and to dislodge the red spider, which is likely to be prevalent in a warm, dry room. A Tyrian plant-sprinkler with a bent neck is excellent for this purpose, as the curved neck enables one to throw water on the under surface of the leaves with some force. I have used one with very satisfactory results for several years.

Now, let us consider very briefly some plants suited to different windows. A north window offers the fewest advantages; consequently the number of plants suited to it is small. *Pandanus utilis*, *Pandanus veitchii*, *Sanswiera zealanica* and some of the ferns will do reasonably well, and the first three are easily managed. Give them the same culture as that prescribed for palms later on. The *Sansevieria* requires but little water, and will surely be killed by a continuous oversupply.

In an east window that receives sunlight the greater portion of the morning the above plants are still more satisfactory, and in addition such plants as flowering begonias, primulas, asparagus and ferns are at their best, while geraniums, bulbous plants and a host of others give very satisfactory results. In a south bay window, by an intelligent arrangements of the plants, we can successfully grow all the plants mentioned above, and in addition a wide range of plants that love plenty of sunshine. If the greatest amount of bloom with the least work is desired, bulbous plants are the best. With chrysanthemums, narcissus in variety, and hyacinths, the entire gap between fall and spring outdoor bloom can be covered; so the problem of continuous bloom is easily solved.

My custom is to have a few foliage plants, a few all-winter bloomers, such, for instance, as geraniums and begonias, and to fill the balance of the space with plants that bloom at definite periods. I begin with a goodly number of chrysanthemums—early, mid-season, and late. If the room is not too warm, these will last till late in December. Before they are gone, the paper-white narcissus and the Chinese sacred lily are in bloom and the Roman hyacinths are coming in. By proper management these may be had till late in March. Beginning with the middle of January, narcissus, (Trumpet Major, Incomparable, Von Sion, and Poeticus,) follow each other in close succession, and the Dutch hyacinths cover almost the entire period; while scattered along through the entire winter are a host of other bulbs, such as oxalis, freesia, ixia, sparaxis, scilla, and the king of bulbous plants—the hippeastrum, or so-called amaryllis. Before this succession is ended the early bulbs are blooming out-of-doors and spring is with us again.

We will now deal more specifically with a few of the aforementioned plants, and will present an outline of the method of culture suited to them. Of the

palms, the *Kentia* is the hardiest and most satisfactory for window culture, as it is less affected by the dry air and dust of the living-room than any of the others. It is slender and graceful and of slow growth, thus lasting a long time before becoming unwieldy. There are several varieties of *Kentia*, but only two, *K. belmoreana* and *K. fosteriana*, that are at all common. These differ so little that the casual observer would hardly recognize them as distinct varieties. The palm does not need much sunshine. Its requirements are a deep pot, solid potting, good drainage, and uniform moisture. In repotting it, loosen the outer roots from the ball of earth so they will enter freely into the new soil, and be careful to pack the new soil at least as solidly as the old; otherwise it serves to conduct the water down and out before the old ball has time to become wet. Loose repotting is responsible for the death of many a palm. The soil used by florists is rotted sod and well-decayed cow manure, with a little sand. It is a good plan to sponge the foliage frequently with suds of Ivory or Castile soap. This will keep the pores open and be a great aid in keeping the plant free from a small brown scale that infests palms. The foliage should be thoroughly rinsed with clear water after sponging.

Of the ferns, *Nephrolepis exaltata bostoniensis*, or the Boston fern, is the best for the living-room. It is a rapid grower, and its fronds droop very gracefully. It is practically free from insect pests, which is a strong point in its favor. Give it a rich, porous soil, composed of leaf-mold and sand, good drainage, and an abundant supply of moisture, and its growth will be very rapid. Its fronds frequently reach the length of five feet.

*Asparagus plumosus* and *Asparagus sprengeri* are also satisfactory plants for the amateur, as they are very easily managed. Of the two, *plumosus* is more feathery, and *sprengeri* makes the more rapid growth, but requires abundant root room. They both require a liberal supply of moisture, but will thrive without much direct sunshine. I once grew a plant of *sprengeri* from a thumb-pot to a giant with fronds eight feet long, which was root-bound in a ten-inch pot, all within thirty months.

Of the blooming plants, I will give cultural directions for the geranium, the begonia, and the chrysanthemum, as these are fair types of this class.

To have geraniums bloom freely all winter they must be grown with this object in view. Plants that are taken up from the border where they have bloomed all summer, cut back and potted up will generally grow rather slowly through the winter and come into bloom in March. The objection to this method, which is very common, is that it leaves us without bloom during the dark winter months, when flowers are most appreciated. Opinions differ somewhat as to the best time to start the plants. I prefer to start them in April or May, and to keep them potted all summer. In May plunge the pots in the garden where the plants can have sunshine the greater part of the day, and, if possible, where they will be protected from the hot summer winds. Grow the plants slowly, shifting to pots a size larger as they require it. As the plants develop they can be pinched back and shaped to suit the taste of the grower. Remove all buds that appear, and thus compel the plants to use all their energy in forming roots and branches. Water should be rather sparingly given, but care should be taken to never let the plants receive a check, as they seldom fully recover. Use soil composed of rotted sod, rotted cow manure, and enough sand to make it porous. Pot rather solidly, but look carefully to drainage. If the plants are well grown by the time they are to be removed to the house they will have five-inch pots well filled with vigorous roots, and will be in shape to respond to a more generous supply of food and moisture, and will bloom freely through the dark

days of winter. The plants should be gradually accustomed to their winter quarters. Bear in mind that they have spent the summer in the open air, and give them plenty of ventilation. Guard them carefully against a check at this time, for it is a critical period with them.

In plunging pots, I have come to use and recommend the following method: Dig a shallow trench and place three inches of coal ashes in the bottom of it; arrange the pots on the ashes, making due allowance for growth, and fill in around them with earth. This insures drainage in wet weather and prevents the entrance of worms, and experience has taught me that it is easier to keep the worms out than to eradicate them once they have entered.

The treatment of begonias differs in only a few particulars from that given for geraniums. The soil should be composed of leaf-mold and sand, in which a little rotted cow manure and a very little bone-meal may be incorporated. The pots should be plunged in a more shaded position, that is protected from the winds, and they should have more water.

Chrysanthemums should be started in April or May for large specimens, and up to July for smaller ones. Put the young plants into small pots, in a mixture of rotted sod and sand. The soil should be made a little richer at each shift by the addition of rotted manure and bone-meal. Chrysanthemums should have an abundance of moisture, as they should be grown rapidly. A severe check is very injurious, not to say absolutely fatal to the blossoms. When the plants are six inches high pinch out the tops to make them branch. From four to six of the most vigorous and most symmetrically arranged branches should be retained and the others removed. If large, spreading plants are wanted, these branches may be pinched, and thus made to rebranch. Shift the plants to the next size pots before they become root-bound. Pot quite solidly, but provide for free drainage. Plunge the pots as soon as the nights are warm enough, and tie the plants to stakes before they begin to bend over.

The extent to which repotting is carried must be determined by each grower. For show specimens they may be shifted up to thirteen-inch pots, but for ordinary purposes from five-inch to eight-inch pots are much more convenient. If large blossoms are wanted most of the buds will have to be removed. My preference is for blossoms from three to five inches in diameter, and a well-grown plant can produce from twelve to twenty of these. From the time buds appear until color shows, weekly applications of liquid manure are very beneficial, as the chrysanthemum is a gross feeder. Before the plants are brought in, which should be before frost, they should be carefully examined for the black fly or aphid, which is very apt to infest them. If this gains a foothold in the house, it is very hard to eradicate. For want of a means of fumigating the plants, I spray them thoroughly with weak tobacco tea. Great care should be exercised to keep this off the buds, as it is apt to stain them. In selecting varieties, it is important to select some early, some mid-season, and some late, to prolong the season of bloom.

Now we come to the lazy man's flowers—the bulbs. These are the most satisfactory plants the amateur can grow, for many reasons. Their culture is simple, and with any show at all they are practically sure to bloom. A very important point in their favor is that they occupy space in the window only when in bud and blossom. Notwithstanding the amount of downright abuse they will stand and still look cheerful, no class of plants will so generously repay good culture. A healthy bulb contains a new plant with food and energy to carry it over the resting or dormant period. It is ready to begin growth at both ends, and not at all particular which end begins first. Under unnatural conditions, it is likely to begin at the wrong end—that is, the top—and this causes many of the

failures with bulbs. The essential point in bulb culture is a vigorous root development before top growth begins. In the garden this is secured in a very simple way. Outdoor bulbs are planted late in the fall, and by the time top growth is ready to begin the weather above them is cool and gradually cools the soil above them. Thus the temperature above them becomes lower than it is beneath them, thus providing ideal conditions for root growth. In growing them under artificial conditions we must imitate nature in this respect.

Let us consider the treatment of the hyacinth and the narcissus. With slight modification this will apply to all the hardy and half-hardy bulbs for winter blooming. Pot the bulbs as early in the fall as they can be procured. Many expert growers say that it does not matter so much what kind of soil is used, provided it be porous, since the bloom is in the bulb. However this may be, I thoroughly believe in carefully preparing the soil, and am satisfied that the bloom is much improved thereby. A mixture of rotted sod, leaf-mold, and sharp sand, fertilized with bone-meal, has given me best results. Rotted cow manure may be used with safety, but fresh strong manure of any kind is almost certain to rot the bulb. Provide abundant drainage; fill the pot rather loosely with soil, leaving the top of the bulb slightly exposed. The soil may be lightly pressed down about the edge, but do not pack it about the bulb, and never press or screw the bulb into the soil. The roots, when they start, instead of penetrating hard, closely packed soil, are likely to lift the bulb. Give hyacinths plenty of root room—say a five-inch pot for the average first-grade bulb, and a six-inch for the extra selected; the narcissus does not need so much room. Many of the varieties will do very well in a four-inch pot, but better results are secured by putting several bulbs in a larger pot, as this secures more even moisture.

If the soil is very dry it should be sparingly watered, but not flooded, as bulbs in a dormant state are impatient of water. Choose a well-drained situation in the garden, if possible protected on the north and west; dig a trench a foot deep, and line the bottom of it with three inches of coal ashes. This provides good drainage in wet weather, and also keeps out worms. Arrange the pots in the trench, placing a tall label with each variety. Fill the space among the pots, and to a depth of an inch or two above them with ashes, and fill the balance of the trench and round it over with earth. This arrangement provides congenial conditions for root development. When the ground begins to freeze cover the trench with about six inches of leaves or coarse, strawy manure. This secures the semi-hardy varieties against frost, and makes it easier to dig up the pots in cold weather. At least eight weeks should be allowed for root development. When the pots are taken up they should be placed in a cool, light room to perfect the growth of foliage and flower stems. A temperature of fifty degrees is about right for this purpose. When the stems have reached the proper height the plants may be placed where they are to bloom. Sixty degrees is a good temperature for this stage. The rule given by Peter Henderson & Co. in their fall catalogue is, 40 degrees for roots and 50 degrees for foliage and stems, 60 degrees for best flowers, 70 degrees for quick development, 80 degrees to rush bloom, with loss of substance and danger of blighting.

I have secured very good results by placing the pots in a cool, dark cellar instead of burying them, but the danger is that the soil is likely to become too dry after root growth has begun, and thus give the plants a severe check. The method is not satisfactory as a rule, and is likely to be more troublesome than burying. Single Dutch hyacinths are easily flowered in glasses of water, but the spikes are not so good as those grown in soil. In following this plan, care should be used to not let the sun shine on the glasses and heat the water, as it causes decay.

Roman hyacinths, paper-white narcissus and Chinese sacred lilies do well in lily bowls, several bulbs in a bowl, and held in place by pebbles. In every case the bulbs should be set in a dark, cool, well-ventilated place to form roots.

I wish now to make a plea for my favorite bulbous plant, the hippeastrum, or so-called amaryllis. I cannot understand why these plants are not more generally grown. Their handsome foliage, regally beautiful flowers, and the ease with which they are managed, ought to render them popular. True, the first cost of the bulbs is rather high; but, whereas a hyacinth blooms once and is thrown away, the hippeastrum is good for years, not to say a lifetime. The genus *Hippeastrum* comprises thirty-eight distinct species and several varietal forms, mostly of South American origin. In addition, there is a long list of hybrid forms with remarkably beautiful shades and markings, some of which bloom several times a year. The oldest hybrid form, and at the same time the most popular hippeastrum in cultivation, at least in this country, is *H. johnsonii*. This is a cross between *reginae* and *vittatum*, and was produced by an English watchmaker named Johnson in 1799. Dealers are generally very loose and inaccurate in classification of these bulbs. They usually place three or four separate genera that require very different culture under the single name amaryllis. This doubtless leads to many disappointments.

The culture of the hippeastrum is very simple. Give it soil composed of strong loam, comparatively free from decaying vegetable matter, and made porous with sand. A little bone-meal is beneficial, but manure is not advisable. Keep it potted the year round, in as small a pot as possible, as it is healthier and blooms better when somewhat root-bound. In potting, leave about two-thirds of the bulb above ground, and use the utmost care to not injure the roots, as scarcely anything else is so fatal to the hippeastrum as to have its roots interfered with. Drainage is of the utmost importance, as in the growing period it must have an abundant supply of water, and yet the soil must be kept sweet. In their native habitat these bulbs have a continuously wet season, in which they grow and bloom, followed by one correspondingly dry, in which they rest. These conditions must be imitated under artificial cultivation. Give them a season of rapid growth, followed by one of perfect rest. Most of those in cultivation bloom in winter or early spring. When growth starts, give them a warm, sunny position and plenty of water, with an occasional application of liquid manure. When in bloom, they last longer if put in a partially shaded position. Keep them growing on rapidly until the next season of rest approaches, which is from July to September, according to the variety. When the leaves begin to turn yellow, gradually withhold water and ripen them off. When at rest, set them in a cool, dry place and give them complete rest until the approach of the next growing season. A few of the species are evergreen and should not be allowed to become quite dry. Give them just enough water to keep the foliage from wilting, but not enough to start them into growth. I cannot here give a list of species and hybrids desirable, for such list is long, but will mention *H. aulicum*, with its variety — *platypetala* — as they bloom in early winter. For decorative purposes, the unnamed seedlings are excellent, and are lower in price than the named forms.

In conclusion, permit me to say that in selecting the varieties mentioned in this paper, and dealing somewhat fully with their culture, my purpose has been to fix attention on a representative class of plants that are easily managed and are comparatively inexpensive. With the exception of the hippeastrum, no attempt has been made to give prominence to any one variety. Many of the common flowers with which our borders are filled in summer are very satisfactory

winter bloomers, if grown for that purpose. Aster, ageratum, antirrhinum, candytuft, nasturtium, petunia, phlox, sweet alyssum, salvia and many others are profuse winter bloomers and satisfactory window plants. The common morning-glory grown as a pot plant will literally bloom itself to death. Nature has been so lavish in the creation of forms suitable for all conditions, and better still for all pocketbooks, that no one need be without a bright, cheery window during the dull winter months.

#### THE SECRETARY'S REPORT.

In our state the year 1901 has been, horticulturally, a success. The exceedingly wet weather distributed well over our state in the spring not only gave trees and plants a good start, but was, we believe, the means of keeping our trees and deep-rooted plants through the summer drought, and of aiding the apple, especially, to hold its fruit. All fruit-trees and plants seemed to bloom to their utmost and the promise of an abundant harvest came early. Strawberries in the southern part of the state were very fine and abundant, and prices were excellent. The dry weather setting in in June, caught the strawberries in the northern part of the state, and after the first picking, which was good, they dwindled and dried up and the crop was almost an entire failure. Any kind of irrigation would have been profitable. Blackberries and raspberries were practically a failure, drying up upon the bushes; and in this connection I would urge the planting of more dewberries, which I understand from information gathered at the summer meeting of the Missouri horticulturists, often bring \$1000 per acre, with little care.

The summer apples and early peaches, such as tried to enlarge and mature in the July drought, were very inferior, which opened our markets to a great influx of Texas and Arkansas fruit; but the autumn peaches and apples were never better or more abundant, and everybody ate and canned. Our winter-apple crop was the largest in the history of our state. This does not imply that individual orchards had never done better, but that more trees were in bearing than ever before. Thousands of young orchards bore their first marketable crop, which shows that, even with no more planting, Kansas will rank near the very head of the list in her total apple crop in a very few years. Immense orchards have been quietly planted during the past five to eight years, more largely through the influence of this Society than from any other incentive, and the country was surprised at the largeness and area of the crop; counties never before having enough for home use had thousands of bushels to sell. Buyers, while hastening to the older, well-known orchards, were surprised to pass thousands of these younger trees full of fruit.

Up to about August 15 the apples were so small and made so little show that these inexperienced orchardists made little or no preparation for marketing, and when the crop appeared in all its beauty and quantity there was a barrel famine, a lack of help, and a scarcity of buyers. Consequently, while early sales netted large prices, toward the last many anxious growers were willing to and did sell at quite low figures. This is deplorable, as the buyers, with the help of cold storage, are in a fair way to reap immense profits, much of which our orchardists should have received. All Western cold stores were early filled to their utmost. We should have neighborhood cold-storage plants, which, if economically built and handled, would pay for themselves very quickly. I am sorry to add that hail destroyed the fruit in some localities noted for fruit-growing. This is always likely in some part of our state, as we cover so many miles of latitude and longitude.

Our people are still planting, and we believe the area now being mapped out for spring planting will be greater than ever before, and hope our Kansas nurseries may get all the trade. The purchase of fruit-trees, berry plants, shubbery, evergreens, roses and flowering plants from irresponsible, generally horticulturally ignorant agents, representing nurseries far removed by climate, soil, etc., and not amenable to our horticultural laws as to misrepresentation and wrong names, should be frowned down. "Buy only for Kansas nurserymen, and the nearest one at that," should be a Kansas motto. We have at Topeka the largest wholesale nurseries in the West, if not in the union, and your home nurserymen can get anything you want, if he does not have it on hand. I do not modify this remark in any particular. No plant grown for cultivation, in any country, state, or isle of the sea, is beyond the reach of your home nurseryman, if you give him your order and he understands his business. Stand by your home nurseryman and do n't let the "whole root," "forest-tree root," "double worked," "imported stock," "pickled" (or prepared) stock or any other boggy mystify you or take away your senses. Do n't spend money that way. What you do not understand do not believe until your home nurseryman or county or state horticultural society makes plain or condemns. You are all aware that I have no interest in any nursery. But I speak from long experience, in the above paragraph. I must add to this, buy of your home gardener and of Kansas canneries. This is not a narrow argument; it is straight business sense. Do not buy any horticultural product from "over the line" until you have exhausted the resources of our state in that line.

You will remember that a year ago I took great pleasure in telling of the thirty-eight barrels of elegant Kansas fruit contributed by you, then in cold store awaiting action of our legislature before being placed on exhibition at Buffalo. Alas! it was not so to be. The senate passed an encouraging bill, carrying \$40,000 for a Kansas display at Buffalo, but the house refused to pass it. They redeemed this action by appropriating \$75,000 for a display at the coming Louisiana Purchase Exposition, which opens at St. Louis on May 1, 1903. The state committee for this exposition is composed of energetic, bright, intelligent, up-to-date gentlemen, who look on horticulture as one of the more important lines of exhibit, and will surely deal liberally with Kansas horticulture. The thirty-eight barrels of fruit referred to came out of cold store early in April in elegant condition, with a few exceptions. The Kieffer pears were all mush; the York Imperial apples were brown; one or two other barrels of mixed fruit were in rather bad order. The bill for cold storage would have been nineteen dollars, but Mr. Moeser made it a free gift to the Society, and we should vote him thanks and life membership for his disinterested liberality. The apples were sold by Whiteker Bros., of this city, and, after deducting drayage, barrels, and a small traveling expense, the balance of \$56.99 was turned over to our treasurer for general purposes.

The American Pomological Society, of which this office is a member, held its biennial meeting in Buffalo on September 11, 12, and 13, and on request of the secretary, by your liberality, I gathered three barrels and seven flat baskets of fruit, to which the agricultural college added twenty-one baskets more, which were all forwarded to Buffalo, and by me placed upon tables prepared for the purpose in the annex of the horticulture building, being exhibited for award of Wilder silver medal. There was a large exhibit from the states and Ontario, but there was nothing to be ashamed of in the Kansas exhibit. It was crowded, for lack of room, but the individual specimens of apples were the best of their name

on exhibition at that time. The peaches were simply unapproachable. The chief of the division of pomology, at Washington, filled himself and his pockets, and uttered continuous praise on their good qualities and beauty. The medal was gained. Early next morning our beloved President died, and the exposition grounds were practically deserted. Upon inquiry, I found that I could enter the fruit for premiums in the Pan-American Exposition; so I made seven entries. First, the entire exhibit by the State Horticultural Society. Second, the college exhibit. Third, the college grapes. Fourth, the college plums. Fifth, the pears of B. F. Smith, of Lawrence. Sixth, the peaches of Geo. A. Blair, of Sumner county. Seventh, the imitation fruits made by Miss Lizzie Rubart, of Junction City.

### ORCHARD CULTURE.

By R. DE GARMO, of Oswego.

*The Apple.*—Before we proceed to cultivate it will be necessary to select the location and plant the orchard.

*Location.*—As a general proposition, select a tract of rolling ground with good deep soil, such as would raise a good crop of corn, and if for a home orchard, near the dwelling-house; although many of the best bearing orchards are planted on low or bottom land, but not many farms have such land in a suitable location for a home orchard.

*Preparation of Ground.*—The ground should be put into a good state of culture by deep plowing, the soil well pulverized and free from weeds and trash. Then take a team and large plow, and plow a deep furrow on the straight side, a suitable distance from the edge of the plat, across the land to be planted. Then set stakes thirty feet distant on a parallel line, and make the next furrow, and so on until the ground is all marked off in one direction; then cross the first furrow with similar furrows at right angles to the former every thirty feet, and the ground is ready for planting.

*The Trees.*—To be successful you must have good stock. If possible, go to a reliable home nursery and get thrifty three-year-old trees with low heads, grafted with scions cut from the best bearing trees and not from nursery trimmings. See that the roots are not allowed to dry before planting.

*Planting.*—Take your load of trees to the ground, and by simply opening up the loose soil at the furrow crossings you have a suitable place to plant your trees with little hard work. Shorten in all the straggling roots, cutting with an under slope, and set the tree as deeply as it stood in the nursery, packing the fine dirt firmly around and over the tree roots, till absolutely on a level with the ground around it. I would lean the tree a little to the southwest, on account of the prevailing winds. Now take your team and plow two or more furrows around each row, throwing the dirt on the roots of the trees, level off the ground, and this is their first cultivation. It puts the roots so far under ground that they will not dry out, or the tree be blown about by our gentle Kansas breezes, and your orchard is planted. [Do not fail to tread or tramp the ground well over the roots of each and every tree.—SEC.]

*Distance.*—There is quite a difference of opinion among apple growers regarding the distance apart to plant. It looks very like a waste of ground to plant small trees thirty feet apart; but is it? I think not; the ground will be better cultivated for a few years, which will be for the benefit of the trees, and will repay the owner at the same time. We have many orchards about Oswego, the trees seven or eight inches in diameter, planted on the close plan, whose



branches now interlock, and in summer when in full leaf almost completely shut out all sunshine from the ground; the result is they bear little or no fruit. The writer planted an orchard of three-year-old trees three years ago, and had a few fine apples this fall, with more to follow.

*Peach Trees in Orchard.*—Some advise planting alternate rows of peach trees and apple trees. Well, I have tried that plan to my entire satisfaction, and will say do n't do it. In the first place, the peach tree is a gross feeder, and when rapidly growing robs the apple trees of the necessary fertility which the apple must have to insure and continue its healthy and profitable growth; then the peach is a short-lived tree at best, and soon fills the orchard with dead trees and fallen limbs, spoiling the looks of the orchard. I saw, only a few weeks ago, near Columbus, an orchard planted in this way; the owner had just "dehorned" his peach trees to save his young apple trees, cutting the limbs back to mere stubs; and they were fine budded fruit, from which he had sold a good crop of peaches the previous year.

*Cultivation.*—The young orchard needs good, clean cultivation, stirring the ground around the trees three or four times, at least during the first part of the season; and if dry, cultivate them oftener, but not later than the middle of July or first of August.

*Pruning.*—Here is an important subject, on which the writer will probably differ somewhat from many orchardists. I take the tree in hand as soon as, or even before, it is planted, and shorten in all straggling branches, even the main center shoot, which the nurserymen tell us not to touch; if it reaches up much above the other branches I cut it off. I try to leave the most top on the south and west sides of the tree, as a protection from the sun, and cut smoothly from the north side, and keep out all watersprouts while the tree is young and small; in other words, I trim for a round-headed tree, and succeed in it, too. I know President Wellhouse says he do n't trim his orchard, and I have been told his orchard shows it; but then he does other necessary things, if he do n't trim it—such as spraying, cultivating, etc.

*What Kinds to Plant.*—Now we come to a very important question; for if we expect to have a variety of choice fruit for family use or for market, it will need much care in the selection of summer, fall and winter varieties, to have a constant supply of each in season. So much depends upon the location and kind of soil, that I will only name a few kinds that have given the best results in my part of the state on all kinds of soil, and leave the planter to choose his old and favorite kinds to fill in with. For summer: Red June, Early Harvest, Red Astrachan, Cooper's Early, Sweet June, Early Strawberry. For autumn: Maiden Blush, Rome Beauty, Roman Stem, Fall Wine, Grimes. For winter: Mammoth Black Twig, Gano, Jonathan, Winesap, Missouri Pippin, York Imperial. I shall plant an orchard next spring, and the above list will nearly or quite fill the bill. There is now coming to the front a new apple, that would seem, as far as tried, to be likely to supersede the famous Ben Davis, both in eating and keeping qualities, and that is the Mammoth Black Twig, a few specimens of which I now have on hand, which I gathered from the orchard in which they grew. They are as large as the Ben Davis, bright red, and of the quality of the Winesap, and said to be a good-keeping winter apple. If it proves on further trial to be as good as it now appears, it will be the long-desired apple to take the place of Ben Davis, both for home use and the commercial orchard. The tree is hardy, a free grower, and a good bearer. I shall plant quite largely of it for my own use. In fact, I have about sixty trees of it just coming into bearing that promise well.

*Spraying.*—There is one thing in raising a young orchard that needs careful attention, and that is the injury done by the rascal leaf-roller or leaf-crumpler; even the first year they are planted, if not looked to and destroyed. One good spraying with a solution of Paris green, about the time the leaves come out, will generally kill off the pests. After that, do not forget to spray the young trees at least once each year with Bordeaux mixture, containing a small amount of Paris green, to keep the trees in a healthy state of growth and free from insects and fungi. And now, plant an orchard, plant largely, and take good care of it, and you will receive the blessings of the present and future generations.

## DISCUSSION.

A MEMBER: What season do you prefer for trimming or pruning trees?

R. DE GARMO: They say there is a certain time to trim; I carry a knife in my pocket the year round, and whenever I notice a limb not right I cut it off. The small blade of a jack-knife is about the right size. Whenever I see a twig that does not appear right coming out on a tree, I cut it off, regardless of the season.

A MEMBER: Why not strip it off without using a knife?

R. DE GARMO: That leaves a ragged place; but if cut off smoothly with a knife it heals over quickly. I have not trimmed the tops of my trees since they were six or seven years old.

DOCTOR BOHRER: I take off limbs throughout the year, but if at this season of the year, between now and the time the leaves put out, you take off much wood, I think you will find a tendency next year to develop a large amount of wood; but if you wait until the trees are in bloom and then take out limbs, the efforts of the tree will be immediately directed to healing that wound.

W. B. EAMES: Orchards were ruined by putting alfalfa in them. I sowed alfalfa in my orchard and the orchard ruined the alfalfa. It is no place to raise alfalfa. I raise corn successfully among apple trees, and think it protects the trees from southwest winds. I have had the tops of my trees full of corn-stalks to hold the limbs on the southwest in position until they grew so strong the winds would harm them no longer. I cultivate corn among my trees until they are from five to seven years planted. Trees put out thirty feet apart each way will grow six rows of corn between the tree rows; plant with a lister; do not go deeply after the trees begin to send out roots; and about the time the space gets so narrow I could put only three rows of corn between, I found the roots had begun to reach across, and then of course I quit planting corn there. What might be done with a disk I do not know; an objection to the disk is it cuts the roots. I do not believe in interfering with roots in Kansas at all, but shallow cultivation that scrapes the surface is all right.

MR. BAKER: My experience has been in Phillips county, in western Kansas. The only way I could keep a tree alive through the summer season in that county was to wrap the trunk with paper, to keep the hot, blistering sun from killing the bark on the south side. In western Kansas it don't do to cultivate ground around trees in the heat of summer; the tree will blister on the south side from top to root and die. If I could get cloth, especially white cloth, to wrap the tree from the ground up, or even to dig around the tree and start the cloth down in the ground, which would keep the insects from crawling into the roots, and then wrap the tree trunk well up into the limbs. I have kept my trees alive through the summer season in that way, and also kept rabbits away from them. I found paper preferable to rags. While cultivating, if I found a little watersprout I broke it off, but if it was long I let it go; it shaded the tree, especially if on the south side, and protected it from the hot sun. In Jefferson county, where I now live, I must cultivate differently; I tried paper on the trees again last summer,

especially on the hills, and saved ninety-nine out of every 100 trees. I advise wrapping trees with paper and not trimming the south side much.

MR. CARTER: I think I know something about pruning and the time to do it. A yearling nursery tree will branch out from the ground clear to the top the next year. If you wait until these branches get out two, three or four inches long and try to remove them with a knife it becomes an endless job. At the start we do it with the hand; sometimes wearing a glove to keep from hurting the hand. My advice is, if you are going to trim an orchard, don't do anything else until you get that trimming completed; and the best time is in May or the first half of June. Cut off little limbs that cross and ride each other, both becoming worthless; they will have poor fruit and leaves, which take the strength of the tree that should go into fruit. Take these limbs off when small. Don't wait until they get big, but trim every year, removing the little limbs that you see are going to be a detriment to the tree. Use in trimming all the good sense you have—good judgment as well as a knife. Trimming done when the limbs are small leaves the least possible scar. Limbs lying on the ground should be removed before they get that way. If you take out some of the limbs the rest will then incline toward the top, though where there are many some will lay on the ground.

A MEMBER: There are varying fruit belts in this state; the eastern quarter belongs in the same fruit belt with Missouri. The center is radically different; and the western part cannot be governed by the practices of fruit-growing in the eastern part. One man says use water in setting out a tree. That would not do in western Kansas, because a hard ball forms around the roots, and in drying it cracks open and air gets in and kills the tree; so that would not do in western Kansas.

L. A. GOODMAN: Adaptability of climate and soil should be considered in planting. Adaptability of soil for what you wish to grow is certainly a very important feature in orcharding. It makes no difference what you plant; if the soil is not adapted to its growth, you may rest assured it will fail. The character of the subsoil is still more important, and unless you consider its character you are sure to fail in growing orchard fruits. A loose, clayey subsoil, not too gravelly, so that moisture will not pass up too rapidly, is best. We should favor subsoils that will retain moisture and will also allow moisture to rise. The next point is the individuality of the tree. I don't know that I have ever realized that quality more than in the last two years. Even in the same variety there are peculiar individual trees. That individuality is more valuable, with proper soil and subsoil, than other qualities. This individuality of the tree is very important. In the Ben Davis there are classes and varieties just as distinct as can be imagined, and worth more or less in the orchard. I think our nurserymen are generally getting hold of the idea, and following it out to a greater extent than ever before. Our planting extends over different characters of soil simply because we desire to plant large bodies of land, but when I am planting trees I know some of them will be worth ten times as much in certain congenial localities than in others, and I know that because I know the character of the soil. I think all fruit-growers ought to study this.

DOCTOR BOHRER: In some portions of Missouri the subsoil is hard-pan. Did you succeed by subsoiling there, or would you advise not planting orchards on such land?

MR. GOODMAN: If you desire a profitable orchard don't plant on hard-pan. We tried to subsoil where there was hard-pan on one of our farms and it was a failure.

A MEMBER: Is there any virtue in subsoiling?

MR. GOODMAN: In some soils very much; in some soils none. On the best orchard soils subsoiling is useless. On some soils it is absolutely necessary to subsoil, if you want to have even partial success; but if you select the proper soil, with suitable subsoil, you need not subsoil plow it.

E. E. YAGGY: Our first apple trees were planted about nine years ago. We have planted several hundred acres quite successfully. There is one small area that must be replanted or given up, owing to the hard-pan which exists under the surface.

A MEMBER: When did your apple trees commence to bear?

MR. YAGGY: Several years ago. We have planted rather largely of the York Imperial.

DOCTOR BOHRER: Is your Black Twig satisfactory?

MR. YAGGY: We planted the Black Twig trees only six years ago and they are hardly due to bear much yet, although we have had some fine specimens. The Black Twig grows remarkably with us. They grow in a sand that is almost white.

DOCTOR BOHRER: Do your Winesaps do well?

MR. YAGGY: Yes, sir; they do very well indeed. I have heard the statement that the Reno county Winesaps were very fine, and I think whoever made that statement shows excellent judgment, because the Winesap is certainly a fine apple as grown there.

DOCTOR BOHRER: What variety of pears did you plant?

MR. YAGGY: Almost entirely Kieffer.

DOCTOR BOHRER: Did all your varieties of pears succeed alike?

MR. YAGGY: Yes, sir; they were about the same; we have not gathered many pears.

DOCTOR BOHRER: Have you any Bartletts?

MR. YAGGY: No, sir.

DOCTOR BOHRER: Have your pear trees bloomed well?

MR. YAGGY: Yes, sir; very freely.

DOCTOR BOHRER: Are the trees healthy?

MR. YAGGY: They suffered considerably from blight, and we have to keep up a running fight with it all the time. We renewed as many as ten per cent. of our pear trees in one year.

DOCTOR BOHRER: How does your York Imperial compare with the Black Twig?

MR. YAGGY: Both our York Imperial and Mammoth Black Twig are just coming into bearing; so I cannot say. We have faith in them, although I understand the Black Twig and York Imperial both have a tendency in our county to fall before reaching their best color. We have a block of 4000 Jonathan trees bearing lightly, and we have learned that, according to recent investigation, the wind does little for pollination, and have concluded that bees are our only resource to pollinate those Jonathan blossoms. What is the best way of handling a block of forty acres or more of Jonathans to produce the most fruit?

MR. WELHOUSE: Your Winesap, I understand, is of large size?

MR. YAGGY: Yes, sir. We have a very luxuriant growth of Winesap trees.

A. L. BROOKE: A thought comes to me. Along about August, rig up some machinery and prune the roots off one side of those pear trees. Pruning the roots will ripen the wood and make the buds more vigorous for the following spring, and I believe you could be successful. I believe your pear orchard is all right, and if you can run some kind of machinery along one side of the rows deeply and prune the roots on that side it would be of sure advantage. The

matter is evidently too much growth in the fall, and if you can shut off that growth in any way you will benefit your trees.

H. L. FERRIS: I stopped with a man once who was raising pears with never any blight, and his trees were then seventeen years of age. His practice was to cut the roots all off within two and one-half feet of the tree with a spade. His theory I do not understand, but he raised pears.

W. H. UNDERWOOD: Our trees are growing in very light, sandy soil. We use the disk and cutaway harrow and we cut off all our top or surface roots. It may be that we are entirely wrong; our trees may tip over. We have cut very close to the tree, and our rule has been that we needed to cut the upper roots off to induce roots further down, because, owing to very hot weather, the roots on top of the ground do not do as much good as roots deeper down.

MR. CARTER: I think sun-scald is caused in winter and not in summer. Sometimes, when the mercury is below zero, the sun comes out and thaws a narrow strip up that side of the tree which is exposed to the sun, and in the spring as the tree grows it splits, and we then discover it; but the damage was done in the winter. Corn is a necessary thing to grow in a young orchard, and it is easy to go through the orchard in the fall and cut a bunch of corn-stalks and tie them up on the side of the tree to protect it from sun-scald. It has been a success with me.

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### ORCHARD TREATMENT.

By W. B. EAMES, of Ottawa county.

Different kinds of good treatment of an orchard may vary in different localities. Perhaps the best way to treat an orchard from start to finish has not yet been discovered; although some methods are much better than others. I saw an article only a few days ago, in one of our leading newspapers, stating that seeding an orchard down to alfalfa was all right. Well, it may do in the eastern part of the state. The writer has known of several apple orchards being ruined in Ottawa county by seeding to alfalfa, and I have my doubts about it being the best method anywhere. I have had more experience with the apple than with other kinds of fruit-trees; so will speak in particular of the apple. While an orchard is quite young, before the feeding roots start, if the plow is run so as to throw the soil well up on the body of the trees, these roots will form higher up on the trunk; then, with careful cultivation with the right kind of implements, so as not to disturb these surface roots or feeders, the soil next to the trees will gradually work away, from the effects of cultivation, wind, and rain, and as the roots enlarge they will be exposed next to the tree and will become much larger and healthier than if kept covered deeply. The sharp-pointed-shovel, one-horse cultivator has done its mischief by catching the brace roots while quite small and dragging them around across other roots, where they have taken hold and grown again, leaving one side of the tree without necessary support. The orchard disk has also left its bad effect by cutting off, or nearly so, these most important of all roots; for these are the ones that make healthy trees and big apples. After using the orchard disk one season it was discarded; and then the Acme harrow was tried, and with perfect satisfaction. I believe that after an apple orchard has come into bearing, cultivation should cease; weeds and annual grasses allowed to grow until large enough to mow; then keep mowed down, except when there is an excess of moisture in the soil; then, if allowed to grow for a short time, they will assist in evaporating the surplus water from the soil, and when the ground dries enough to drive onto, cut the weeds with a mower.

Set the trees so as to cultivate and mow both ways; for if mowed but one way the perennials get established in the row and ripen seed, and soon the orchard is sodded to perennial grasses, which is very detrimental to an apple orchard, especially in the western two-thirds of the state. I have had some expensive yet valuable experience with a moth-catcher, which proved a failure with me, for codling-moth. I shall try spraying, another season. Would head apple trees about three feet from the ground; where headed too low it is inconvenient. Trim while trees are young, seldom cutting large limbs.

## POPULAR VARIETIES OF APPLES.

### THE JONATHAN APPLE.

FRED. WELLHOUSE: We have been growing Jonathan apples for over twenty years, and it is the most profitable apple we grow. Our books show that it is ahead of the Ben Davis, Winesap, Missouri Pippin, or any other; and we have probably made twenty per cent. more money from Jonathan than from any other variety. Very often it has assisted us to sell the balance of our crop. No other apple bears equal to Jonathan with us. This year we were able to put 400 barrels of Jonathan on the market as "fancy," for which we got four dollars a barrel. We have never been able to do that with any other variety. In number of bushels it outyields anything we grow. It has some faults. One is that it drops as soon as ripe. As soon as it is ready to pick it should be picked, or it is on the ground and goes into second grade. By care to pick it at just the right time, we have made it pay better than any other. It blights worse than any other tree we have, excepting the York Imperial, but we have never lost a tree through blight. I do n't think we ever lose any trees excepting by borers or something similar. On the whole, we favor the Jonathan, and plant just as many as we can care for.

E. J. HOLMAN: Do you say that the Jonathan blighted, or that you have never lost any by blight?

F. WELLHOUSE: We have never lost a tree by blight. It always blights on the shoots of the current year's growth. It never, that I know of, blighted back of that.

### THE BEN DAVIS APPLE.

A. L. BROOKE: We have thought for several years past we were going to be overdone on Ben Davis, but the fever is catching. They are taking up planting the Ben Davis in the East. There is not an apple to-day in the commercial line that by fifty per cent. has the backing of Ben Davis. I would like to have 150,000 Ben Davis trees to-day to sell. I could sell every one of them. They are selling in the East now by the car-load.

### THE GANO APPLE.

J. W. CURRY: I can indorse what Mr. Wellhouse said regarding the Jonathan. We have a few of them and they have done well with us. They are young yet and have not a fair trial with the others. I speak on the Gano because my earliest planting was of Gano. They have been out for eleven years and have produced two partial crops. I cannot say they were a great success or that any apple in our community, in Jefferson county, has been a great success; but I think I can speak of the Gano, which is a new variety, better by comparing it with varieties you already know, since the Gano is comparatively a new variety. My Gano orchard of 1150 trees adjoins another orchard of equal extent planted to Missouri Pippin and Ben Davis, of the same age. The trees were bought of the same party

and were set out at the same time. The Gano trees were only second-class trees when set, while the Missouri Pippin and the Ben Davis were first class. The soil is the same, as nearly as I can tell. The Missouri Pippin and Ben Davis have the better location; they are situated on a north slope, the Gano on a gentle south slope. The Ganos have proven as hardy as the Ben Davis, and I think they have excelled them in this particular, for the Ganos have not lost more than one-half the percentage that the Ben Davis have; and the Ganos have not lost to exceed one-tenth of the number that the Missouri Pippin have, although I must admit I have given better care to my Ganos than was given the other varieties; yet I do not believe extra care caused any more of the Ganos to live, neither do I think lack of care caused any more of the Missouri Pippin and Ben Davis to die. The Missouri Pippin root-rotted and turned out of the ground; no such calamity as this befell the Gano anyway. Ninety-five per cent. of my Ganos have lived; they are thrifty, vigorous, symmetrical, and beautiful. But the supreme test of any commercial variety is how much income they will yield; "By their fruit ye shall know them." The Missouri Pippin begins to bear earlier. The Ben Davis has fruited similar to the Gano; but the Gano has always excelled in quantity. This year I sold Ganos for two dollars per barrel, orchard run, while packers only paid \$1.50 to \$1.65 for other varieties. I do not say this discrimination was justified and it may not continue. My conclusions are that the Gano is preferable to Ben Davis and far preferable to Missouri Pippin for my locality.

F. HOLSINGER: Mr. President, we have with us to-day the originator of the Gano apple. Let us have a word from him.

W. G. GANO: Within the last year or two I have become convinced that the Gano apple is a little more attractive to the codling-moth than Ben Davis. In some localities the Gano appears to do magnificently, and I think we find better specimens this year than most any year it has been my pleasure to examine them since it was disseminated.

J. W. CURRY: I don't believe one apple in 100 of mine had a codling worm in it this year. No, scarcely one in 200.

A VOICE: Did you spray?

MR. CURRY: I did not. I cultivated some, but I did not spray. Both the Ben Davis and Gano with us were especially free from codling worms.

#### THE WINESAP APPLE.

JOHN BRAZILTON (Wathena): Our experience of the past ten years as growers has failed to show any serious faults with Winesaps, and as the years go by each one seems to leave a better impression of this grand and beautiful apple. In the race to see who can obtain the largest acreage of apple trees this apple has, possibly because the tree is a poor grower while young, been overlooked. Enough of them, however, have been grown that it has attained a reputation on the markets where, after the Jonathan is off, it commands the very top price. Nor, in my estimation, has it attained the reputation justly due it, but will, in a very few years, rank with, if not excel, that great fancy market apple, the Jonathan. Quality rather than quantity, or I might say a more even balance of the two, will be the leading factor in the profitable production of the apple, and other fruit crops as well, in the future. Let us see how well the Winesap is adapted to the situation. We will take up the good qualities first, and will consider, first the fruit, and secondly, the tree. I have here two apples that are just a trifle above the average for this year, on account of the drought and the heavy crop the trees were bearing, but are about what we expect the average to be in a year of sufficient rainfall. I can't imagine an apple any more beautiful, and I have yet to see one that is. Perhaps I can give no higher

praise as to its quality than to say that it is just as good as it looks. The best criterion of quality that we can find is the price that people are willing to pay, and the fact that the Winesap commands the top price of its season is sufficient indication that it is the best. By its season we mean for No. 1 stock, from the 1st of February to April 1 or perhaps a little later. The principal buyers at this time are the stand and fancy family trade, both being buyers that require the very best, and if it is not the best they don't want it at any price. What they will bring by February, would be hard to predict; but with Jonathan given the preference, as it always is at this time of the year, Winesaps are now quoted on the Kansas City market at sixty cents per peck, or the small sum of \$6.60 per barrel, which is at least \$5.50 per barrel to the man who stores them. A No. 1 Winesap is too good to cook and too expensive for people of average means to use for that purpose. The No. 2's make an excellent all-round family apple, and will sell for that purpose to people of moderate means almost as well and bring almost as good a price as No. 1 Ben Davis. With us the Winesap is free from bitter rot or other decay, and as a consequence the third grade is composed almost entirely of small but sound apples that make the very finest of cider, which retains the rich color of the fruit. In no other apple do we find such a rare combination of quality and color, together with the most desirable size for either market or home use. The nearest approach to it that I have seen is the Arkansas Black, of which I know nothing except that it is a very nice-looking apple. The Winesap tree is one of the healthiest trees we have—much more so than Ben Davis—and in regular bearing it is only excelled by the Missouri Pippin. The tree is rather a dwarf grower, but the wood is very tough, and holds its immense loads of fruit without breaking. As I have said before, the tree is a poor, scraggy grower when young, and requires regular pruning to make a shapely tree, which is very hard to do at all on poor soil. A Winesap tree about six or seven years planted is about as poor a looking specimen of vegetable growth as can be found, and to any one not acquainted with its habits the temptation to dig them out at about this age is almost irresistible. The low-growing habit makes it very easy to gather the crop, and a great part of it can be gathered from the ground. To those who spray their fruit the scant foliage is also an advantage, as more of the spraying compound gets on the apples, and it also takes less of it to do the work. When we come to enumerate the faults of this apple, perhaps the worst complaint that can be made against it is that it grows small on old trees. We maintain, and we think we are proving it by actual experience, that with proper culture and proper attention just as good Winesaps can be grown on old trees as on young ones. Another fault, and one that we expected to be the ruination of our crop during the extreme hot weather of the past summer, is, that the scant foliage allows the sun's rays to come into too close contact with the growing fruit. During the drought the apples looked as though the skin had all been scraped off them on the side next the sun; but after the rains came these blemishes soon disappeared, only an occasional apple showing any bad effect from the scorching heat. While attending the meeting of the Missouri State Horticultural Society, at St. Joseph, the first of the month, we learned that the Winesap is not satisfactory in Missouri, being badly affected with scab. We do not find it so, and some fruit that we saw at the Missouri meeting, from El Dorado, Kan., showed that there are other parts of Kansas that have been successful in growing good Winesaps; in fact, about the only really first-class apples of this variety that we saw at the meeting were from Kansas. To those who have the Gano or Ben Davis craze, I would advise: grow Winesap, if they are successful with you, and



let Missouri raise the Bens, as the time is coming when one barrel of Winesap will be worth two of Ben Davis.

C. W. MURTFELDT: Reference has been made in that paper to the Winesap apple in Missouri. Anywhere in the county of St. Louis, where I live, you can tell a Winesap tree when you see it. It has the poorest foliage of any in the orchards. There is no fault about the quality of the apple, but it is a question whether it is advisable to plant it largely unless neighbourhood experiences show that it has done well there. It has poor foliage with us—more so than any apple tree I know of.

#### THE MISSOURI PIPPIN.

A. L. ENTSMINGER: I have a twenty-acre apple orchard, and ninety per cent. of my profits this year came from the Missouri Pippin. It has done better for me than any apple I have ever grown as a commercial winter apple. For these reasons I champion the Missouri Pippin. It is not a long-lived tree. It should be double-worked to make it best. It is much subject to root-rot. It will fall over in a year or two, and you will find the roots all rotten and dead; but in order to bring it to the best it ought to be double-worked on something that will not root-rot. I think the Rawles Janet is the best I ever tried for the purpose. It is not very long-lived, but it is one of the best from a commercial standpoint. My ground is Kansas river bottom, good enough to grow the best corn; perhaps on other soils it might not be as good.

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### SECOND DAY—Afternoon Session.

FRIDAY, December 27, 1901.

The Society met and began business with a short discussion on "Mounding Apple Trees."

MR. BAKER: I would advise every one to save your wood ashes, and in the spring dig away from around the trees and put the ashes there, with a little dirt on top, and you will almost double your fruit both in quality and quantity.

PRESIDENT WELHOUSE: Where do you get wood ashes on the prairies?

MR. BAKER: We burn straw and corn-stalks and wood and brush, and the ashes taken out of the house I put in a shed near by and save them for this purpose. Coal ashes are good, but not as good as wood ashes. Wood ashes are a benefit to any kind of stone fruit. They are better for plum or peach than apple.

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### STONE FRUITS.

By WILLIAM CUTTER, of Junction City, Kan.

The subject assigned me embraces so much that I may pass over some fruits with fewer remarks than you think them entitled to. But please remember that our wise legislators have fixed the bounds beyond which we cannot go unless we talk about cattle, hogs, or wheat. The nectarine is the most unimportant of this class of fruit. It is about as hardy in tree and bud as the peach, but its smooth skin and soft pulp are so tempting to the curculio and its kindred, the gouger, that we rarely find a ripe specimen without a puncture. It should only be planted as a doubtful experiment. The apricot is also a rather unprofitable tree to plant, although it sometimes gives us a good crop. It is about as hardy in tree and bud as the peach or plum, but its habit of blooming so very early

usually makes it an easy victim to a belated spring frost. The tree agents have invented a late-blooming variety that they sell upon their honor. The Russian varieties possess no advantage over the older and better kinds. Every one should plant a few trees. He who plants it for profit is making a mistake. The plum is of more value than the two preceding fruits, but there is so much "chaff among the wheat" that it takes an expert to sift it out.

There are three distinct classes of the plum largely planted in this state. The European, the Japan, and the native. I will not attempt any scientific classification, as I think you understand me; they are so distinct that each requires separate consideration. Our native, or American type, the Wild Goose, Miner, etc., while perhaps the poorest in quality, are the most hardy in tree and bud, and adapted to a greater variation of soil and climate, less subject to attacks of insects, and, to shorten a long story, are worth more to us than all others combined. They thrive upon almost any soil; still a sandy one suits them best. The European sorts, as Lombard, the Gages, etc., are much the better in flavor, and sometimes produce a good crop, but are so generally destroyed by insects or rot that their cultivation is not profitable. Always plant a few trees of them, and when they do bear the satisfaction will pay you for all they have cost. A clay subsoil is best for them. The Japan plum is of comparatively recent introduction, and, with its California and other seedlings, has about driven all others out of the south and far western portions of this country. Its area of success is well defined; but unfortunately we are too far north. It is displayed in all our markets. Its large size and fine appearance always attract attention, which, with the volumes of praise that people read, has created a demand for the trees far north of its line of successful culture.

#### THE CHERRY.

In this we have the surest tree to grow and bear that we know of. Still it is a lamentable fact that not one farmer in ten grows an adequate supply for his own family use. It is at home upon all soils; it is longer lived and perhaps more productive upon a clay subsoil. We have nearly all of us given up the idea of growing sweet cherries, but still many of the Germans and down-easters are anxious to give them one more trial. The Early Richmond, Montmorency and English Morello are the three best varieties known. The Dyehouse is so near like the Richmond that it is always getting nurserymen into trouble. The fruit always sells at paying prices, and I have never seen a market oversupplied.

#### THE PEACH.

The location for a peach orchard is of great importance, and while we have and still do advocate planting upon the highest spot, especially if adjacent to a deep ravine or other low land, we have found out by experience that this site is not always the best. Cold weather is the greater, yet we need not think it the only, cause of failure in this latitude. But failure comes in so many different ways and at different seasons that there is no infallible rule for success. Our buds are killed more frequently by a cold, still night in midwinter than by any other cause; and it is upon such occasions that our highest sites assert their superiority, and even a slight elevation will often prove of great advantage. A striking case was demonstrated this year in my own orchard. I have five-year-old peach trees in rows, thirty-five rods long, on second bottom running to a hill facing the north; there is an elevation of twenty-four feet in these rows, and this year there was twice the fruit set on the trees at the upper ends that there was on the lower; and still lower, on the first bottom, there was hardly a peach to be found.

Last year our peaches were hurt much worse than they were this, and in exactly the opposite way from this year. They came through the winter with hardly the loss of a bud until in April, and when they were nearly in bloom we were struck by a cold wave that began with rain, and we had a cold, stormy night, the mercury going to three or four below freezing. This storm destroyed the greater portion of the crop upon high land, excepting where sheltered from the wind; while on the low land, where we failed this year, we obtained our best fruit. These partial failures have suggested some things that are worthy of the peach grower's attention, especially if it was dry in July and August, which is no uncommon thing in this country. Of five rows running to the hill before mentioned, the Elberta and Salway were damaged at the lower ends of the rows by birds, while the Greensboro, Captain Ede, and Triumph, after losing the greater portion of their buds at the lower ends of the rows, still produced a much more valuable crop than at the other ends, where the trees were overloaded. Another suggestion: there is hardly an orchard of any extent that some portion of it is not more favorably situated than others; so, plant Elberta, Heath Cling, Salway and other varieties that seldom overbear on the most favorable part of the orchard; and plant Crosby, Triumph, Early Barnard, etc., upon the most unfavorable. They will bear heavier crops than the other list will upon the more favorable part. While the habit of extra productiveness is sought for by the average planter it is a great nuisance to the commercial fruit-grower. Not only was the fruit on my Triumph and Early Barnard (where they overbore) worthless, but a large proportion of the trees are dead.

It would hardly be using the Greensboro right to pass it without special mention. It is the nearest drought-proof of any peach known. My trees were loaded to the last twig, and every peach grew to fair marketable size. It was worth more than double that of any other variety ripening in July. The drought of July and August damaged the Elberta and all that ripened before it. We have known the same thing to occur before, and advise planting more late-bearing trees. We seldom fail to receive good rains by the last of August or the first of September, which insures us good late fruit, after the products of the principal peach districts are out of the market; and if we grew such fruit in marketable quantities I believe we would find a ready market for it, both north and south. Some may ask what I mean by marketable quantities; I will explain. We have heretofore received good prices at our local markets. Such prices cannot continue much longer. There will soon be too many grown for our near-by markets to consume, and then, if we are not prepared to ship in car lots, the express men will hardly leave enough to satisfy the commission men. Long before the end of the next decade, if we succeed as we have in the past, we ought to be shipping peaches by car- or train-loads from every county-seat in this part of Kansas.

But we will never get out of the woods, and must keep a lookout for new pests. This year, for the first, leaf-curl did us considerable damage. It was particularly bad on Captain Ede, Elberta, and the Crawfords, destroying much of the fruit and small twigs on the inside of the trees. We must get after it with our sprayers and a solution of sulphur, lime and salt before the leaves start. The best information upon the subject is to be found in a book issued by the United States agricultural department. But of all the enemies to the peach, or fruit culture in general, no culture, or even poor culture, is the worst. When the growth of either tree or fruit is checked by neglect, drought, or any other cause, it is at the mercy of its enemies, while a thrifty tree or fruit is either not attacked, or it has the power to resist it. In answer to any who may

say we have no control over the weather, I will say, from my own experience and observation, I know that had we kept our extension disk moving early in the season, the damage by drought in July and August would have been reduced to a minimum.

#### DISCUSSION.

SECRETARY BARNES: Throughout the West there have been numerous complaints of birds eating the fruit, especially the grapes. Parties have written me that birds have practically destroyed their entire crop of grapes. Here is a suggestion to any one of you who is bothered that way: Go down to any stationery or toy store and buy a dozen little hawk kites, the Chinese variety, and tie them with a string not over eight or ten feet long to poles of good length; put each pole at an angle, among the fruit-trees and over the strawberry beds, and the birds will not bother the fruit. The wind, when there is a wind, keeps the kites bobbing around in the air, and the birds never come near enough to investigate. It is a thing well worth trying. The reason for putting the pole at an angle is so the kite string will not wind around the pole. This scheme is a good one, is comparatively cheap, and will practically save your fruit.

A MEMBER: Will they fly when you don't have wind?

MR. BARNES: No, but they require a very light breeze, and the pole being at an angle, they will hang suspended in the air anyway.

A MEMBER: Birds usually work very early in the morning, when it is generally pretty still, with no wind.

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#### COMMERCIAL PEACH GROWING.

By A. CHANDLER, of Argentine.

This is the subject assigned me, though I will scarcely be able to do justice to that deservedly popular fruit—the peach. It is to-day receiving more attention from fruit men than any other fruit, with the possible exception of the apple. I will treat my subject under the following heads: Location, varieties, planting, cultivation, spraying, commission men, packing, and markets.

It is desirable to secure the most elevated location possible, in the states of Kansas and Missouri. A north or east slope is to be preferred; soil should be a sandy loam, and well drained. Land liable to wash should be avoided.

Varieties will claim close attention. We have too many varieties; many of them undesirable. Some new ones are heralded with great praise, which, after a year or more fruiting, are found wanting.

We have found the early peaches lacking in quality; they are also liable to rot. Then, too, they are placed upon the market beside better peaches grown South. These facts effectively bar them from profitable cultivation. It is not possible to name a list suitable for all seasons and locations. From a thorough trial, we have found the following very desirable and best suitable to our market, namely: Triumph, Greensboro, Mountain Rose, Family Favorite, Champion, Elberta, Old Mixon Free, Smock, Salway, Heath Cling, and Wilken's Cling. The following new varieties are gaining in favor each year, viz.: Fitzgerald, Captain Ede, Carmen, Matthew's Beauty, and Emma.

In this latitude we prefer to plant in the spring, having prepared the land the previous season; 180 trees to the acre, planted in rows both ways.

Cultivation to some extent will be governed by circumstances. The newly planted tree will require close attention; in fact, it will respond to good care, the same as a hill of corn. Borers can be partially controlled by mounding the tree

about ten inches high. This will also hold the tree in its proper place in case of a severe storm. One-third of each year's growth should be cut away, which will add greatly to the beauty of the tree and also enhance the future value of the orchard. We recommend thorough and clean cultivation, continuing until August 10, especially in crop years; running lightly with the disk harrow, with the extension provided for running under the tree, will be found to be both safe and expeditious.

Spraying with poison for the destruction of insects has not been satisfactory, but for leaf curl, a parasitic fungus, the Bordeaux mixture is invaluable; (for a special treatise on this subject see Pierce, published by the department of agriculture.) Leaf curl can be controlled and finally eradicated. The curculio yearly destroys thousands of dollars' worth of peaches. A description of its work is too familiar to recite here. The old-time method of jarring them upon a sheet is not to be lost sight of. Clean cultivation, and the destruction of all trash, leaves, etc., will secure partial immunity from this pest.

The commercial grower should make some provision for canning; this would greatly relieve a full market. A lack of proper organization and the excessive duty on tin are serious barriers to this industry. A few ringing resolutions placed in the hands of our congressmen might be productive of good.

Packing and marketing: With all the facilities afforded by our railroads, we lack thorough methods in distribution. Much of our surplus would be used if it could be placed where it is most wanted. Too much emphasis cannot be placed upon proper grading and packing. There is no excuse for placing upon the market imperfect, wormy or over-ripe peaches. It destroys the confidence and respect of our customers, and in the end will destroy the market. In a period covering fifteen years, we have noticed that fancy peaches have always brought good prices; the market has not had too many of them. We cannot censure certain practices of the commission man too severely. One sure step toward reform is for the planter to grow salable fruit and for the handler to do honest packing. A good example is a powerful teacher. In closing, we say that commercial peach orcharding up to this date has been profitable.

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### THE ELBERTA PEACH.

By GEO. P. WHITEKER, of Topeka.

The Elberta peach is without question the most profitable peach grown. It originated in Georgia, and is a cross between the Crawford and the Chinese cling. The fruit is a fine shipper, free from rot, large, juicy, colored yellow and red, and ripens the latter part of August and the first part of September in this section.

As soon as the Elberta gets ripe in Texas, we commence to handle them, and continue to, from Arkansas, then Oklahoma, then Kansas. After the Kansas Elbertas are gone, we have failed, so far, to get any; whether it is because the peach does not do well north of here, or whether it is on account of none being planted, I cannot say. As soon as the Elberta is gone, the market drops to less than one-half. The tree is one of the thriftiest and finest looking, from the time they are budded until they are grown, of any tree I know of. You cannot afford to plant a peach orchard without planting freely of this peach.

## THE CHAMPION PEACH.

By EDWIN SNYDER, of Oskaloosa.

The Champion peach originated at Nokomis, Ill. Fruit large, beautiful in appearance; flavor delicious, sweet, rich, and juicy; skin creamy white, with red cheek; freestone. Season about August 20. The peculiarity of its acquisition of hardness, and the crowning event in its history is its having stood a temperature of eighteen degrees below zero in the winter of 1887-'88, and produced an abundant crop the following season; and again, in 1890, producing a full crop when the peach crop was a universal failure. It is a freestone. Who buys it once will buy it twice, and then continue to call for it as long as it is on the market. I have raised one crop of the Champion peach. I have 1000 trees, and I believe it is going to be one of the most popular peaches grown. Of late there has been a growing demand for a white peach, and I believe the planting of Elberta is being overdone. I have 3600 Elbertas that are bearing, but if I had it to do over again I would plant the Champion and Salway. One good thing about the Champion peach is that it has the best foliage of any peach tree I know. I can see the Champion foliage as far as I can see my orchard, and tell it. I am told that leaves are the lungs of plants, and I look upon the Champion as one of the very best peaches grown.

## THE SALWAY PEACH.

By FRANK HOLSINGER, of Rosedale.

The Salway is among the most valuable of peaches that has been as yet introduced. It is said to have its origin in England, with Thomas Rivers, of Sawbridgeworth. The tree is quite vigorous in growth, very productive; ripens as the Smock has gone; flowers rather small; glands uniform, fruit large, roundish, oblate; suture broad, deep, extending beyond the apex; skin downy, creamy yellow, with a rich, clear, crimson cheek when ripened in the sun; flesh deeply yellow, stained with red at the stone (which is free), juicy, melting, rich, sweet, slightly vinous, very good.—Downing. A good cropper. The Salway is second in value of the many varieties introduced. It seems to have the quality of adaptation to all conditions of soil and climate wherever peaches can be grown—being hardy. In the process of ripening being the latest, its season is longer continued than any other. During the past season they were in sight from September 1 until November 1. This may have been because of the many seedlings of this sterling sort. That it reproduces itself from seed in a remarkable manner I know, as do many others; were it not that many are clings when so produced from seed, the propagation of this variety by budding would be so much extra work. I have propagated many trees, fruiting them, and have always succeeded in the production of good fruit. Some years ago I planted a number of Salway seedlings, forty-nine of which came into bearing, all of which were valuable sorts, possessing many of the characteristics of the parent. A few of them would have been worthy of propagation, yet none were better than the parent. They were large and beautiful. Nine were cling; some were high-colored; two were blood clings; one cling, for size, was among the very largest I have ever seen. One sported as to time of ripening, coming in immediately after Elberta. This is the only one of particular merit, and I hope to see it close an important gap in filling out the peach season.

As a luscious peach, when fully ripe, the Salway is hard to beat. As a coming peach it has no equal, ripening late, at a time when all want it. In other words,

it is the "last chance." They are firm and stand up well in the cans, and when opened speak for themselves. All hail Salway! The gem of all the peaches. Had the Orientals known the value, the high appreciation to which the peach (Salway) was destined, I do not wonder at the mythology attending it. By Darwin we are led to believe that it was evolved from the bitter almond, and they surely are of the same family. They are propagated in the same way and budded on each other. Each contains in its seeds the most poisonous of all oils, prussic acid. They are so nearly alike as to defy the most skilful horticulturist to detect a difference in either blossom, leaf, or plant. The fruit is, however, vastly different, the almond possessing little more than a stone covered with a thick, dry, woolly skin. In France, the almond is preferred as stocks for propagating the peach, being considered hardier. The habitat of the peach was Persia and China—introduced into this country in 1680 from England, where its merits were known for more than 100 years. The climate of England is not particularly suited to the peach, on account of the lack of warm sunshine, so necessary to develop its higher qualities. It is a fact, however, that many of our best sorts are of English origin; the Salway is one of these. The American Salway is very much better in quality than its English ancestor. Peaches in England are grown against walls that have been whitewashed. China is said to suit the peach equally with the United States in this particular.

It certainly is strange that a fruit possessing so fine a flavor should for so long a period have been considered poisonous by the Chinese. We are told that the peach holds a similar position in the Orient as that of the tree of knowledge of the old Scriptures with us. A pretty story exists there: that the peaches of a certain tree, when eaten, conferred immortality, but it bore only once in a thousand years. Another tells of a peach tree of knowledge that existed in a remote period, guarded by demons, and producing death when eaten. Is it not barely possible that these stories may have originated from our biblical history of creation? However, ancient peaches, descended from the almond, as Darwin suggests, when edible, were small in size, have evolved until they are of the Salway type. How thus transformed? We answer, through cultivation, selection, bud variation, seed variation, and accident; and now we have arrived at the present condition in the Salway. To seed variation we owe more than all else. This includes pollination, from which or through which the seeds have been fertilized. Whenever the variation is such as to disclose a difference from the parent and of sufficient economic value to be worthy of propagation, then a new variety is added to our list of varieties. Great harm is done to the public by inexperienced nurserymen seeing variations in the peach and, imagining they are possessed of value, proceeding to propagate and enforce upon a confiding public a worthless variety.

#### BARKER'S SEEDLING PEACHES.

By F. G. BARKER, of Salina.

[Secretary Barnes read this paper, the author not being present.]

Many of the old orchards planted by the pioneers of the United States were of great value, although they depended almost entirely upon seedling trees. To these seedling orchards we are indebted for many of our best varieties of fruit, especially apples. While the early fruit-growers of necessity planted seedlings, at the present day, with almost unlimited varieties to choose from, it will be folly, generally speaking, to plant a commercial orchard of seedlings, and expect it to prove anything but a disappointment. Yet I have had a fair share of success

with seedling orchards. With the exception of the peach, I would not now plant a seedling of any kind save as an experiment. The plum might be of value, for it is fairly persistent; yet, as a seedling, it is a nuisance; for all seedling plums I have grown sprout equal to the sand plum. The peach *never* sprouts, comes into bearing three years from seed, and, if care is taken in the selection of pits, I think a seedling peach orchard will prove as profitable as an orchard of selected stock, and, in some localities like my own, more profitable.

I have experimented extensively with peaches, and raised and fruited thousands of seedlings, and expect to continue to grow peaches. With the exception of a very early peach, I shall depend almost entirely on seedlings. Some peaches are persistent; that is, trees grown from pits produce fruit like the parent tree, with reasonable certainty, generation after generation. Many yellow peaches will do this, but the Heath Cling is the only white peach that, with me, has proven persistent.

I have seven varieties of seedling peaches. Some of them I think I originated or improved; others I discovered. Three of them I know are persistent. I think all are fairly so. I have named them, for my own convenience, Early Rareripe, Golden Rareripe, Barker's No. 13, Norton's Late, Yellow Rose, Dad's Peach, and Heath. I have discarded many fine seedlings for the reason that they ripen at same period with many other varieties. I have retained only those of superior quality.

#### DESCRIPTION OF VARIETIES.

Early Rareripe is fair to large size, medium early, coming in as Amsden goes out. With careful selection, 100 trees grown from pits will give ninety true to parent; two or three better; two or three not so good. This is my peach, and is an improvement on a seedling I brought from Hancock county, Illinois, where it was known as Felt's Rareripe. I have raised many generations, and by selection it has changed to a large, fine peach, which retains the good qualities of the old Felt's Rareripe, excepting it is coarser in texture, and the pit a little too large; yet it is a fine peach, but does not stand as low a temperature as I would like. Fruit a deep yellow, with red cheek, almost free from down. A showy peach and a good seller. Market price, \$1.50 per bushel at orchard.

Golden Rareripe is my best peach, and is the best all-round peach I have ever seen. I have not been able to improve it, excepting that I have one tree at present the fruit of which averages larger than the others. I first saw this peach in Hancock county, Illinois. My mother told me that the early settlers there had but little fruit, and not much variety; but when the Mormons came they brought trees and seed and planted large orchards, in which were many good varieties of apples and peaches. I think Golden Rareripe came with the Mormons. I gave it the name of Golden Rareripe. An orchard of Golden Rareripe will be in season for about four weeks from the time the first fruit ripens (for they do not all ripen at the same time). When the first are ripe the fruit on some trees is hard and green, yet they are all one and the same. Fruit: Golden yellow inside and out, free from down. Pit very small. Flesh firm, fine grained, and of superior flavor. Fine specimens are nine inches in circumference. A favorite with every one who makes its acquaintance. Sold at my orchard, in the flush of peach time, at one dollar per bushel.

Barker's No. 13 promises to be fine; is hardy, like Golden Rareripe, of which it is a descendant; ripens with the last Golden Rareripes. Fruit large, yellow, downy, and somewhat coarse.

Norton's Late is fine, large, yellow, resembling Elberta; ripens about the last of September, a good time for a commercial peach. I do not know whether the



original in Kansas was a seedling or not. So far it has proved to be persistent. I obtained this peach from J. I. Norton, of Salina, Kan., and therefore its name.

Yellow Rose is late, of fair size and good quality, ripening after the 1st of October. Fruit, pale yellow skin, firm yellow flesh, free from down, but has spots on one side and cracks some; yet it is an excellent peach, and on account of late ripening brings good prices. Trees hardy and persistent. I shall plant new orchards of these varieties and Heath Cling seedlings, which will give me a steady run of ripe peaches from the time Amsden is gone till frost. I have no fear that they will not prove profitable, for they always have. In the market I come into competition with the best varieties known and always hold my own with them. In our dry country the transplanting of the peach tree is a hazardous undertaking; if we set them in autumn they die down to the earth; if we transplant in the spring, and the ground is dry and the tree slow to start, the drought catches it and it is badly stunted or dies. Transplanted peach trees seldom grow a new tap-root.

By planting the pit in early autumn and putting three pits in a place, we are reasonably sure of a stand. The tree will send a tap-root down deeply, which carries it over the dry season. Why buy trees, and go to the additional expense of setting them, when you can plant pits and raise better trees that will be longer lived, and give you abundant crops of fruit equal to the best. My experience here has been with seeds taken from trees not visited by bees (excepting wild bees) in blooming time. I now keep bees, yet I do not think there will be any mixing of Early Rareripe, Golden Rareripe, or Yellow Rose. For these varieties came from a part of Illinois where the air was full of bees all through blooming time. They were persistent there. I think the crossing of these varieties is only possible when, by chance or by injury, the anthers of the blossom are lacking or are not potent. A blossom of this kind must depend on outside agencies for fertilization. I think the persistent peach is so because both organs are ready for fertilization at the same time. Perhaps fertilization takes place before the blossom is fully open.

Vast sums of money are used annually in the distribution of garden seeds, which have undergone no improvement in the last century and can be bought of any seedsman for a trifle. If a portion of this money was used in distributing seeds and trees of persistent peaches and new varieties of other fruit, greater and more lasting benefit would result.

I have never visited a true peach country, like parts of Michigan, Georgia, and on the Hudson, but I have seen some good orchards in Illinois and Missouri and I know something of peaches in Kansas; yet I have never seen any orchard in which the fruit equaled in size, variety, flavor and productiveness my old orchard in 1891 and 1893. It contained about 1500 trees, all seedlings. I do not sell trees, and do not care to sell pits, but I will give any person who comes to the orchard as many pits as they wish, if they will pick them up.

#### DISCUSSION.

G. W. MAFFET: I want to file an objection to that class of literature before this Society. With the long list of elegant peaches whose names are known to us, and whose habits are known to us, and which can be bought of any seedsman, there is no use of going back to the seedling peach. The seedling peach belongs to the pioneer going into a new country. We have n't any demand for it now, and I think that any consideration given a speech of that kind in a wholesale way, as is recommended, and especially commercially, is a mistake. Go into any city market and look at a wagon-load of seedlings coming in from the country, and you cannot help but know that the man who brought those seedlings in

injured the market, in the first place, and that he is wasting his time, in the second place; and we should not encourage anything of that kind. Of course, there may be seedlings that are fine, but there are fruits that are so much finer that it is not worth while retrograding in that way.

MR. SNYDER: I want to second that protest. I think, in this day and age of the world, we do n't want to recommend seedling peaches. There may be a few varieties that are persistent, as you see in the Salway and some others, but it won't do. The originator of the Elberta peach planted 1200 seeds of the best peaches he could get, and out of that 1200 he just got one that he considered worthy of dissemination.

A MEMBER: I protest against the multiplication of varieties. I think we have about 300 already, and out of that number we ought to be able to select ten or twelve that will fill the bill entirely. I want also to indorse what Mr. Snyder said about the foliage of the Champion.

MR. GEORGE HOLSINGER: I want to call the attention of the Society to the Family Favorite, which is giving very decided success in Wyandotte and Johnson counties. We are growing it rather extensively at present, and we have a pretty hard time among ourselves picking it out from the Mountain Rose. The Family Favorite is a remarkable peach. It is as prolific as the Champion, and comes in earlier than the Elberta; is a white peach with a red cheek, and, coming at its season, commands a good price.

MR. MARTINDALE: There has been a good deal said about new varieties of peaches. In one respect I agree with them, and in others I do not. I think we ought all to strive to create new varieties of fruits of good kinds. I have been requested by the secretary to prepare a short paper on a peach I am growing on my place at the present time.

In the spring of 1886 I planted out 150 seedling peach trees. There was one among that number that was noticeable for its strong, healthy growth. When it came to bearing the fruit was found to be of large size, white with red cheek, and red at the stone, which is very small for the size of the peach. It is very sweet, and ripens about August 1, and the dry weather does not seem to affect it. The original tree is still alive and healthy and bore a fine lot of peaches in 1901. The young trees in the nursery row show up well among the other varieties. They nearly always have fruit-buds on the first year; a one-year-old tree that I sent to our secretary, William H. Barnes, matured fifteen peaches in fourteen months after it was put out. Nearly every one, and they are many, that have planted some soon plant more. The trees stood the intense cold of 1899 remarkably well. The fruit has been exhibited at meetings of the Osage County Horticultural Society, and in the rooms of the State Horticultural Society. The president and secretary of the State Society named it the "Martindale" peach. This peach is a very sweet, rich, juicy peach, and every one who has eaten of them speaks well of it. The first year I had any I took them to town, and there were buyers there from different parts of the state, and as soon as they tasted it they wanted it. I did n't have nearly enough to supply the demand. They said it beat any peach they had seen that season. The dry weather does n't seem to hurt it at all. Last summer it held up good. Its season is from the 1st to the 10th of August. It is a white peach with a red cheek, and red at the core, and a freestone.

L. A. GOODMAN: I think, in selecting a list of peaches, we ought to take those more universally known. While I do not deprecate the idea of bringing in new varieties, or such as are worth more than anything we now have, yet only on that condition ought we to bring in a new variety. Of about forty-five varieties we have tested in the last fifteen years, we have settled down to about this list:

Mountain Rose, first; Family Favorite comes next; Ray's Favorite comes third; then comes Elberta, fourth; after that is the Champion, fifth; and then Old Mixon (?); then come Mrs. Brett, Pickett's Late, Smock's Free, and following that is the Salway. Of all the list we have tested, these have almost universally proven most profitable.

SECRETARY BARNES: I invited Mr. Barker to present a paper on his seedling peaches. I am reminded of a time a couple years ago, when I was in Iola, and Mr. Cutter sent a box of elegant mulberries down by mail and stated that the tree bore more fruit than any other tree he had on his place. Some of the Iola folks, who live in a county that grows all kinds of fruit, got up and said they had quit growing mulberries; that they were a worthless fruit for any purpose whatever. Another said he planted them for the birds, but the birds in Allen county would n't eat mulberries and wanted something better. When I got an opportunity I put in my oar, and stated that that was all right for Allen county, but perhaps it would n't do for other places. And so, I say, the talk here this afternoon is all right for eastern Kansas; but the State Horticultural Society reaches and represents a territory 400 miles long. Many of you who came here when I did know we used to go out on the prairies to gather any kind of green stuff—about any way we could get it—something to go along with the hog and hominy. I look on these seedling peaches in the same manner. Out in western Kansas they plant bushels of peach seeds for windbreaks, and they yield fruit of an inferior quality. Once in a while, in one of these windbreak hedges, you will find a good peach—a really good peach—and you know that all our good new fruits come from the seed. Why not encourage our western friends to plant good seeds, and those that will bear good peaches, instead of planting any kind of a seedling peach that happens to come along? That is part of our duties, as well as any other. They are in just the condition we were years ago and we ought not to forget it.

MR. MAFFET: I do n't want this Society to scatter on this subject. I said nothing about new varieties. I am very much in favor of new varieties. If I understand it right, that paper recommended planting *commercial* seedling orchards, and it is against that proposition that I make complaint.

A MEMBER: But he recommends that only for his locality, as I understand it.

MR. MAFFET: I do n't care what the locality, whether in the Garden of Eden or western Kansas. The peaches we have are known. You can get a succession right through the season. I am willing to aid any new seedling that comes in, but I do n't believe in planting seedlings *commercially*. Commercially, you want the best fruit that can be had on the face of the earth. The market is glutted with third- or fourth-class or rejected fruit; but when you come to first-class fruit, you can never get enough of it, and never will. We do n't want any more inferior fruit; we want to get rid of it. When it comes to scientific breeding, I am in for it; but I am certainly opposed to the commercial seedling orchard. When you know what you want, try for it by scientific breeding. In western Kansas is where I got my experience with seedling peaches. They did plant windbreaks of seedlings and orchards of seedlings, and their purpose was to use the ax. A man says he planted 150 seedlings, and that only one was superior, and several were worthy. What became of all the rest? If he had planted a commercial orchard, and used his ax on those that were not worthy, where would his commercial orchard be? That is my point. I do n't object to new varieties.

C. A. CHANDLER: It seems to me the best early peach we have is the Triumph. It comes in after the Sneed. Triumph is a great deal more productive than

Greensboro, though not quite as large, and is about the prettiest peach that goes to market at its season. It comes at a time when they are bringing peaches from the South, and it sells for good prices. We have had this variety growing for two years now, and it seems to me it is the best early peach in existence.

MAJOR HOLSINGER: What is the good of anybody planting the Greensboro and Triumph, or anything like that? They don't bear with the other peaches, and are wormy and gnarly. What is the good of planting those varieties when there are so many others that give more peaches which sell for more money?

C. D. MARTINDALE: In regard to this peach of mine and the hardiness of it, I will say that the original peach tree is growing to-day, strong and healthy, at fifteen years of age; and nine out of ten of the trees will have fruit blossoms on the first year after the bud.

A. L. BROOKE: You have talked considerable about varieties. I have heard from Mr. Snyder on the Champion. I am satisfied you are not taking into consideration location, soil and surroundings of your peach orchards. What may be a success on my farm may fail for my neighbor on his farm with different conditions. In making up varieties you should get down to a hard study of the subject. When the Elberta was first becoming known, I was at Warrensburg, Mo., when they were harvesting them, and they were very fine. The trees were loaded, and rows of Champion right along side of Elberta had the grandest peaches on I ever saw; yet, while the Elberta had bushels, the Champion had only dozens. They said that was the habit of the Champion at Warrensburg in different years. They said they had never yet had a crop. They bore most excellent peaches, that excelled the Elberta in taste, size, etc., but not in quantity. The dollars were on the Elberta trees. Will the Champion sustain itself in Kansas? Might not the Emma, transported from Georgia to Kansas, produce a different foliage? Might not we have in the Emma something we have been looking for? It does seem to me it might possibly be a success up here and a failure in Georgia. One word now in regard to seedling peaches: if a seedling is meritorious, if we happen to get hold of a good seedling peach, it ought to be propagated; but to go back and try to do what the old German fathers found out years ago, when they found that the percentage of successful seedlings of the apple was 1 in 400, it seems to me is not right; it is a very poor chance for success, if the same percentage holds good in peaches, to start a seedling commercial orchard.

MAJOR HOLSINGER: Suppose you want to plant 10,000 trees of the varieties that are recommended, where would you get them at this time?

MR. BROOKE: I would wait until next year.

WILLIAM CUTTER: I have had a few Emmas for the last few years. The Emma is a peach that resembles the Elberta more than any other peach that I have ever known. As to Mr. Barker's seedlings, I budded some of them quite a number of years ago. I have three kinds now growing. There is not really a prolific bearer among them; some of them are very shy. There is one that is an excellent peach, but it is so inclined to rot that I budded but very few with it.

PROFESSOR DICKENS: Are the propagators of these meritorious seedlings growing them in large blocks or isolated? That fact, it seems to me, ought to appear on the records, where seedling peaches are recommended in any way—whether or not the seeds have come from large blocks of trees of a single variety, or trees that have grown in some isolated location.

## HANDLING FRUIT.

By H. E. GOODELL, of Tecumseh.

Being an amateur in the business, other than the strawberry, and feeling that they are sometimes neglected, simply because they do not grow as large as Ben Davis apples, I will direct my remarks to strawberry picking and marketing as practiced on my fruit farm. Strawberries must be handled with great care to get good results; therefore the selection of help to assist in this is of first importance. We procure women or girls when possible for this work; they being much more careful and neater than boys; and it's very easy to turn the price fifty cents lower or higher per crate by careless or careful work. A nicely topped out crate (and I do not mean by this the large berries all on top, because it pays to have big berries in the bottom of the box also) is a thing of beauty, and we always find a demand for such. It does not pay to have children as pickers, or even to allow them in the patch. Nor does it pay to get cheap help; we always pay good prices and then expect good work. When we employ them they are instructed as to the proper way of picking and sorting. Each one is given a number, and this number is entered on our pay-roll. We employ a foreman, whose business it is to see that the work is properly done, keep pickers supplied with empties, give credit on tally-sheet for berries as taken in. This gives me a complete record of each day's picking. By all means cultivate a home market. Sell as soon as possible. I would rather turn by berries over to a reliable commission man than to sell at a reduced price; they can often place them better than the grower. I mentioned sorting; those sorted out are sold as culls. We understand, if berries are to be shipped, they must not be fully ripe when picked, if they are to arrive at destination in good condition. We are now hoping there will be a bountiful supply of luscious strawberries the coming year.

W. D. CELLAR spoke on the same subject, as follows: This subject can be divided into a thousand parts and a long paper prepared on each. A few years ago I reported to this Society that it was never worth while to pay the expense of storage and transportation on second-class apples. Mr. Walter Wellhouse also concurred in what I said. This year the opposite has been the case. In our locality we had no first-class apples—nothing but second grade. Those who attempted to keep them in piles, cellars, or caves, or in any way outside of cold storage, found they melted like butter in the hot sun, and were almost a total loss. Second-grade apples that were put into cold storage paid well for the cost of storage and transportation. Hard-and-fast rules are liable to be broken occasionally. At Kansas City grapes are marketed in a peck basket—a splint basket, a makeshift—an unsightly package, varying in size and weight. There has been a disposition for the past two years to adopt a commercial grape basket. This year more grapes were sold in the Kansas City market in eight-pound baskets than ever before. We will be glad of the time when they are all sold in that way. Bushel boxes are coming into great favor, too. Apples sold on the Kansas City market in bushel boxes bring from twenty to fifty per cent. more than those sold in any other way. They make a better appearance, can be handled easier, are less bulky, and there is much else to be said in favor of the bushel box.

## NEW FRUITS AND NOMENCLATURE.

C. A. CHANDLER: I have not prepared any report on this subject, but a few thoughts which occur to me seem quite important. We used to have several names for the same apple. This is being cleared up now, however. The most important part of this subject is new fruit. In our display there are three seedling apples worthy of at least a trial. The originators and exhibitors wish them named by this Society. It seems to me the originating of new peaches is one of the grandest lines a person could go into. Plant-breeding is a subject that a man could spend a lifetime on as a specialty. If this Society had an experimental farm for originating and testing new fruits, it would be of great benefit. I know it is hard to get an appropriation from the legislature to start anything new, or even to carry on something already started that should be continued; but if the legislature could be prevailed upon to appropriate enough money to buy tracts of land in different parts of the state and equip them with men and machinery for breeding new fruits, it would be of great benefit. For instance, forty acres planted in seedling peaches—not for a commercial orchard, but to originate and test new fruits. The seeds should be selected from the best known varieties, which would be determined by experimenting. Plant them four feet apart each way. The first season probably two-thirds would grow. By the end of four years probably nine-tenths of them would be cut out, and the remainder given further trial. Suppose from this forty acres we obtained in four years only one new peach as good as Elberta: it would be worth all the time and money expended, and would be as valuable to the horticultural interests as the Elberta. Possibly we might get more than one. A similar plan could be carried on in other fruits. There can be no end to the scientific breeding of fruits and improving on old varieties.

SENATOR TAYLOR: I hope the Society at large will not take any stock in breeding new varieties or originating new varieties or monkeying with new varieties. There are specialists for every sort of specialty. There is one man, perhaps, in 100,000 who has the disposition and qualifications that will enable him to grow new fruits and grow them successfully; but you and I, Mr. President, don't have those qualifications, and most of you gentlemen don't have them; and if you undertake it, you will lose your time and your money. One of the curses of high-up agriculture and horticulture and all that sort of thing to the average man is, it is on a plane where the atmosphere is too rarefied for him to fly. Most of us ought to keep right down in the bread-and-butter district, and let this upper-crust business severely alone. There is n't anything in it at all; and there has been more effort wasted by the great common people in grasping after things that were beyond their reach, that they have been incited to by scientists and *psuedo*-scientists; and there have been more labor and money lost than can well be computed.

PROFESSOR DICKENS: Mr. President, I do n't believe that Senator Taylor still plows with bull-tongue and mule! [Laughter.]

SENATOR TAYLOR: The gentleman who spoke incidentally upon the foolishness of commercial peach orchards from the peach seed I thought did well to stick to his point. He could n't be diverted from it by all the talk upon something else outside of the question. The little experience I have had in lawsuits has taught me that when a lawyer has a bad case he brings in something entirely outside of his case. I had no reference to bull-tongues or anything of that sort, and not to the kind of mules referred to by the professor. What I said I am ready to maintain. The majority of people who are engaged either in horticulture or agriculture are wasting their time and their effort and their opportu-

nity when they are grasping after things that are so largely recommended in agricultural papers, in agricultural books, horticultural books and papers, and fully half the talk—yes, three-fourths of the talk—in such societies as this. I have n't a word to say about the efforts of any expert. If any gentleman here answers to the name of expert, he is omitted from my talk entirely. I am not aiming at him. But this business of experimenting for new varieties is only for experts—people like L. H. Bailey, or the professors in our agricultural colleges, or Mr. Burbank, of California, and people of that sort—but the great common people want to keep out of it.

MR. MURTFELDT: I take it, gentlemen, that the day of caste is gone. We have no upper class and no lower class. When I see a multitude before me, on the streets or elsewhere, and they come in regulation dress, I know they are as well qualified in the head as in the body. The day is past when one or two men can be the dictators of everything that shall be grown or known among people. We have our experiment stations, it is true, but Kansas, so far as I know, has but one. There ought to be half a dozen in the state. Then when these men who are in charge give their verdict as to the value of a certain fruit it may go out that way; or this Society may appoint a committee and they will report on five or six peaches, or ten apples, and have it go out as the sentiment and the verdict of this Society as to the qualities of the fruits. I don't like to have a gentleman try to put up any caste here. We are against anything of that sort. We don't want one man to know it all or say it all. I think I speak the sentiment of this Society when I say every man here is as privileged to speak upon a certain fruit as any other man here, or from here to California.

SENATOR TAYLOR: Mr. Murtfeldt has taken me a little too seriously, and he also is getting a little bit off the question. I do not offer the idea that the bulk of the people here are deficient, Mr. President, in good, hard sense, or anything of that sort at all. But nearly everybody who is sitting before me, if they were asked about it, would be prompt to say that they had no special knowledge that would enable them, for instance, to cross different kinds of wheat intelligently or successfully, or to make it a commercial venture. If I were to follow the old revival methods, and ask everybody to put up a hand who thought he was educated in that way, I guess there would n't be more than eighteen or twenty hands held up. The fact is, most of us have n't any such qualifications as those required. To pursue a line of investigation of that sort is a dozen times more difficult than ever dreamed of by people who have never entered upon it or have no knowledge of it. It requires a large amount of technical knowledge that is difficult to pick up. It also requires an amount of time that a man does n't have at his disposal who has to make his money in horticulture or agriculture. He wants a salary to do that sort of thing. As Mr. Chandler suggested, if we are going to do it, it ought to be done by somebody who makes a business of it, or somebody who does it for the love of the thing. Most of us have taxes to pay and families to support, and the sheriff would get us if we were to go into any such nonsense as that at all. I repeat what I said before, that it is madness for us to think about it. It is one of the vices of our kind of life, that we are all the time reaching out for the myth and "neglecting the weightier matters of the law." If I had my way about it, I would have those pink leaves torn out of the catalogues. The things we want are the staple goods, not the impossibilities.

E. B. COWGILL: The discussion is becoming exceedingly interesting, although somewhat wandering. But here is a point I think we will do well to remember, and that is, that experimentation is expensive; and if we undertake to advise everybody in this audience to go to experimenting for new peaches or new apples or

anything else, I think, if these people follow such advice, they will find that they have less money than they expected to have when they get through with the experimentation. There are people who have a genius for these things, as there are people who have a genius for invention. How many people here would undertake to make a million dollars by inventing? This is in the same line with invention; it requires genius for the particular line of work. Mr. Chandler's observation has the germ of a great deal of good in it. The experimentation needs to be made, and Kansas can well afford to have it made. Kansas has an experiment station, with men employed for the purpose of investigating and determining and to create, and help us along that line. We can well afford to contribute to that. We can well afford to contribute to enlarge the work. I think Senator Taylor is eminently correct as to the rank and file of us; and as to those who are engaged in horticulture for a living, unless we have a diversion and are quite willing to pay for the luxury of going into the experimental work, I agree with him that we had better let it alone; and if we want to engage in that kind of work, qualify ourselves for it, and go to work in it at the public expense generally.

#### QUESTION BOX.

*Question:* "Has there been any bitter rot in apples in Kansas this year?"

PROFESSOR DICKENS: Some specimens were sent in to the experiment station and were identified as bitter rot, but the statement accompanied them in almost every case that there were very few such instances, and those few not very badly affected.

MR. MAFFET: I have in my cellar some apples that have the genuine bitter rot.

MR. BAKER: I have quite a number of York Imperials that are badly affected with bitter rot.

MR. SMITH: Among our Willow Twig apples we have some bitter-rot, but among no others.

*Question:* "Who has tried the Stringfellow method of planting, and with what result?"

PROFESSOR DICKENS: The experiment station in 1899 planted three blocks of trees according to Mr. Stringfellow's directions. Nearly all the trees pruned as he recommended are dead. The ones having the best roots at planting are the best trees to-day. These were Winesap, Missouri Pippin and Ben Davis apple trees. It was second-bottom land—good, rich, deep soil.

F. W. DIXON: I have tried the Stringfellow method on peach trees. I planted a small peach orchard in 1899, and thought I would try three rows in different ways—one row by the Stringfellow method, one row partly trimmed, and the other row with the tops and roots intact, as nearly as I could get them. I picked out fifty of the best trees I could get, first-grade trees, and dug large holes and planted one row very carefully. The next row I trimmed the roots partially and the tops partially, and planted that row very carefully. The third row I was not particular about, because I was going to cut all the roots and tops off; so I cut all the roots off and all the tops off and planted them in about one-fourth the time it took to plant either of the other rows. The result was as follows: In the first row of trees, that were planted nearly intact, seven died. In the next row, partially trimmed, eleven died. In the row that was planted by the Stringfellow method only three died, and the others are better trees to-day than any of the



lot. When fall came you could go along and pull the others up with one hand, but you could n't stir the Stringfellows at all.

A MEMBER: What is the Stringfellow method?

MR. DIXON: Cut off all the roots excepting the tap-root, and cut off the top, too.

MAJOR HOLSINGER: We are making progress. We are leaving the footprints of our fathers. For twenty years I have spoken along this line in this Society. This is no new thing with me, but unfortunately I have not the reputation of a Stringfellow and was not able to put out a book on this line, and consequently I cannot claim the honor or the credit of having discovered the Stringfellow method. I have practiced it for twenty years, with the very best results. I think Mr. Dixon made one mistake, and if he had corrected that he would not have lost any trees at all. In the trees of the last row, I think it was, he cut off both the roots and the tops; and if he had left more of the tops and cut off the roots, he would not have lost a tree. My son helped me with this experiment some time ago. The trees that were planted according to the system that is taught by the nurserymen died. The trees with the roots cut off and the tops remaining lived and bore fruit.

A MEMBER: Did you leave all the top?

MAJOR HOLSINGER: Yes, sir; and cut off all the roots, not leaving any root over an inch in length.

J. W. ROBISON: Just for information, I would like to ask a question. The Stringfellow method, as I understand, is to cut off all the root, and then cut off all the top. Now, what I want to know is, *what do you plant?*

MR. BROOKE: I want to correct a little impression Major Holsinger is trying to make here—that the nurserymen are teaching the idea of long roots to trees. You are after the wrong man, major. We are the fellows who want to have the roots taken off. It is easier to dig and handle trees without roots than with them, and the nurserymen certainly have no objection to the roots and tops being taken off, and I do not believe they are teaching the other method of planting.

S. J. BALDWIN: I plant several thousand trees every year. About four years ago I commenced trimming the roots, not quite according to Mr. Stringfellow's plan, but I cut them off to about four inches, and they did well. The next year we cut them to two inches, and last year we cut them to one inch, and we have had good success. I do not claim that a tree without any roots is better than one which takes time and care to get the roots as perfect as possible, but trees that are shipped from one point to another and arrive with mutilated roots would better have the roots cut off. Cut them to one inch, but don't cut the tops at all.

A MEMBER: Where do you live?

MR. BALDWIN: I live in Nemaha county, Kansas.

MR. MAFFET: I think with this Stringfellow method locality is everything. In that alluvial Southern soil, we need fool with nothing but the cutting of a branch. You can take a grape-vine and ram it in the ground, and it will grow there.

MR. FERRIS: I am from Osage county, Kansas. I have planted for the past three or four years about 3000 or 4000 trees, both peach and apple. I shorten in the apple trees, and cut their roots to three or four inches, and tread them in well. They nearly all live. On the peach trees, I cut the roots to about one inch and the top all off. I instruct the nurserymen that they need n't send me more than two and one-half feet of peach tree, with one inch of root. That is all I want to pay freight on.

*Question:* "Who has tried dust spray, and with what result?"

L. A. GOODMAN: Three years ago I thought I would make a test of this dust spray, and in doing so I got one of Liggett's little sprayers and used one pound of Paris green and one pound of dry Bordeaux mixture in ten pounds of lime. I used that on ten acres and am satisfied that it did good. I dusted during that year three times. A year ago I concluded to dust still further, and used it on forty acres, with good results. Last summer I dusted 240 acres and used seven of the dusters. The dry Bordeaux mixture I bought already prepared, that I might be sure it was exactly the same all the time. I used that same last year. I am satisfied it does good. I do not believe it does as much good as liquid spray would. I have asked many who have made extended experiments with liquid spray, and they say they do n't think dusting will be as efficient, but I can dust my orchard three times at no more cost than it would take for liquid spray once. We can dust easily with men only, not having to take a team at all. Another thing: it is impossible to get over 2000 acres of orchard with liquid spray at proper times, in season; but we can get over it easily with the dusters, because we can use a sufficient number of men to dust it easily. The dust must be put on while the trees are moist or damp. We usually dust right after a shower or early in the morning, when the trees are wet with dew. I secured enough results from this experiment to feel justified in continuing it. I believe I can keep fungous diseases off and the insects partially away, and that has been my hope in the matter. I do n't know just how greatly it will succeed, but I know lime dust is almost as good a fungicide as Bordeaux mixture. I do n't know that dusting will be as good as liquid, but we cannot get sufficient water to use, and we adopted the plan of dusting instead. I believe it is one of those things it will pay us to test most thoroughly, because it can be tested without much expense.

A MEMBER: How do you prepare your lime?

MR. GOODMAN: We use fine air-slaked lime.

A MEMBER: How long does it take to air-slake lime?

MR. GOODMAN: It usually takes three or four days, by moistening it every morning, noon and night with just a little water. I buy the Bordeaux mixture, from Liggett Brothers, in New York city. They sell it in the dust form; and buying it in that way I am always sure of having it alike.

A MEMBER: Is it possible to use a solution of Bordeaux mixture for slaking the lime and obtain the same results? Would there be any detrimental chemical change in the nature of the ingredients used?

MR. GOODMAN: As to the chemical action, I cannot say. That question has not been decided. It is being tested now.

SENATOR TAYLOR: We used the dust spray some last spring, but I could not tell positively whether it did any good or not. I presume I spent fifty dollars for dust, chemicals, and labor. I paid five dollars for a little blowing machine, but I could not tell anything sure about the results. On a young orchard, just coming into bearing, the dust spray will make very nice fruit.

JAMES SHARPE: For the past two or three years my apples have been destroyed by apple scab, and last spring I resolved to try to prevent it. I purchased what they called an "Orchard Monarch" and a ton and a half of sulphate of copper. I dissolved my copper; but did not make it as strong as recommended. However, it was strong enough to destroy all my apples. It did not damage the foliage any, and it surely prevented the scab, for the apples were all destroyed.

*Question:* "Are nursery trees injured by being dug and corded up in storage buildings for spring delivery?"

MR. BROOKE: I think that depends! I am too poor to own a good cellar and don't store my trees. I believe if I had a good cellar and plenty of the right kind of material, and the time and money to do it with, I would take them in in the fall and risk it. I think by taking them in late in the fall they would be all right.

WILLIAM CUTTER: Many more are lost by not storing than by storing. Still, if you pack too much they may sometimes heat and destroy part of them, or if they get too dry they will be damaged. It needs much practice to store trees and bring them through the winter without damage. It is much the safer and the cheaper way. We have at times lost almost our entire stock by leaving them out.

*Question:* "What temperature will kill peach trees?"

MAJOR HOLSINGER: Fifty degrees below zero.

SECRETARY BARNES: Does it not depend very largely upon the humidity of the atmosphere—more so than on other conditions?

MR. CUTTER: I have known seven degrees below zero to kill a large portion of the peach trees; while in dry weather, when the trees are perfectly dry, I have known them to bloom and bear a full crop after exposure to fourteen degrees below zero, excepting the tenderest varieties.

A MEMBER: Our peaches were killed this year by a temperature of eight below zero following that cold wave when ice froze on the trees.

*Question:* "Is the yellows in peach trees a matter of heredity?"

MR. SMITH: I have never heard of the yellows in the West.

A MEMBER: I think it is hereditary.

MAJOR HOLSINGER: Did the gentleman ever see the yellows developed in yearling nursery stock? I have received peach pits from all over the country where they have the yellows, and I have yet to see the man who has ever seen the yellows in the peach in Kansas. I claim it is not hereditary, but is a condition of climate and location. Go anywhere east of the Mississippi and you will find yellows everywhere. I asked this question in the Missouri state meeting and failed to find a man in that society that knew of a case of developed yellows. I claim it is not hereditary, but that it is developed.

PROFESSOR POPENOE: I have had experience with a kindred disease—the peach rosette. They are associated diseases. If I read correctly the deductions of the plant writers, they are different forms of the same disease. I had a number of seedling peach trees, grown from seeds from trees which showed peach rosette in the same orchard. I hoped that these seedlings would escape, and planted them in my orchard alongside of Elberta and a few standard varieties. Every tree which was a seedling of the rosetted trees died with rosette. It takes two or three years for those diseases to develop.

MAJOR HOLSINGER: Have you ever examined the roots of trees affected by rosette?

PROFESSOR POPENOE: Yes, sir. I have dug a good many of them at Manhattan.

MAJOR HOLSINGER: Did you ever find the roots diseased at the time the trees were destroyed by the rosette? Were the roots not in normal health?

PROFESSOR POPENOE: You cannot tell by the roots whether the tree has rosette or not.

*Question:* "How can a cold-storage plant on a farm be made a success?"

W. B. EAMES: I did not have exactly a cold-storage plant, but my cellar is quite a success. It is built with heavy walls and double doors and windows, with the windows high, on hinges. The windows are opened at night and closed

in the daytime, during the cool nights. It has a board roof, covered with tar paper, and six inches of dirt on that. It keeps fruit well.

*Question:* "What is the best shade-tree for lawn or street?"

SECRETARY BARNES: American white elm.

A MEMBER: Sugar maple.

A MEMBER: Hackberry.

The hour of six o'clock having arrived, the Society took a recess until half-past seven o'clock this evening.

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## SECOND DAY.—Evening Session.

7:30 O'CLOCK P. M.

The Society met, and the evening session was begun with the following paper:

### EXPERIMENTS IN HORTICULTURE.

By A. H. GRISSA, of Lawrence.

Experiments in any line should lead to progress in that direction. We begin at the low tide of life in thought, and most any undertaking; we can never feel that we have attained the highest in our nature until we end it; we advance, as life's thread is spun, and join the throng above. The heights we attain and the progress we make in our journey depend wholly on the efforts we make. These general ideas apply to horticulture with especial emphasis. In this high art in nature, this fascinating calling, this labor that demands our best thought, we find more confused ideas than in any other labor or profession; this may indicate that we are at the bottom of the ladder that may lift us up out of the mist. In most of our discussions more than one idea is expressed; the first a good thought, the next may be a better one; yet neither may be right, or both may be wrong, or fail to solve the right point. When one advises improving a variety by grafting from a specially good tree, valued for its large fruit and especial productiveness, or to gain anything by cutting scions from particular parts of a tree, and expects to impart its quality to the trees he grows, he works in error; he considers only one element of tree life, but fails to see the real cause that makes the favored tree so much better than others of the same kind. It is on a par with the man who feeds with care a razorback hog and expects a Berkshire at fattening time. Both will be equally successful or disappointed.

Tree- or plant-breeding by selection or high culture never changes the kind, only so far and for the time being as the result of high culture. With rare exceptions, varieties come through seeds only. In nature, where trees have grown since their creation under the same influences, the type is not prone to vary; it is fixed; it is apt to reproduce true to its type; but when grown under other conditions, as by the cultivation of man, then the seed may change its type, at first only slightly, but as the changes continue it may vary more; so much that the original type is lost or that variation has become a second nature. Hence we have so many kinds of our domestic fruits, and so few of the nuts and fruit of the native wilds. The productions of some of our old apple trees are the wonders of nature, when you think of the poor, worthless fruit from which they originated, hardly fit for cider; and yet how fair and grand such apples as the Greening, Spy, Baldwin, Spitzenburg, Jonathan, and the hosts of good kinds

that we love to grow and eat! They were produced at rare intervals. In time the hand that saved the tree is forgotten, but the deed lives after him, to bless thousands.

As I look back, it seems as if some magic hand must have been near; or as if, in some silent night, when the blossom first opened, a shooting star has left a trace of heavenly fitness on the pollen that made the seed for the future tree, and the same care grew the tree to perfection. Fancy a tree growing in some corner, a fine season of rain, and sunshine in its fulness; its wood and buds ripened perfectly, and all through the winter during each cold snap its buds blanketed by the white snow; then with the opening spring the buds swell and burst; its bright beauty of color and fragrance are exposed; then the bright sun, marking the spot of brilliant color, infuses elements in the pollen that only a higher power can; and in time it becomes the Elberta, Champion, Emma, Golden Rareri, or any of the long list of such choice peaches we knew not, twenty or thirty years ago. The same change and influence have made all other choice varieties that we now have in strawberries, raspberries, and all other fruits.

The production of choice fruits from seed is more surely accomplished to-day than ever before, especially as the conditions are better understood. Well may the spot be marked by a monument where the original Baldwin stood; also as other good fruits that blazed the way for a higher civilization and a yet higher ideal for us. We need, more than the fruit-growers are aware, an apple of better quality than we now have. There are many new ones on trial, but their prevailing fault is in not being winter fruit; they are mostly early fall varieties here. I have several, claimed to be long-keepers with other rarely good qualities, but I have not yet proven them on my premises. If we had an apple with quality like the Northern Spy or several others, that would ripen and keep till in April or May and prove productive, we would make the most wonderful advance in fruit-growing known, as it would increase the consumption of apples, increase the demand, the price, the profit, the health of the people, and also increase the tree trade and its many branches of industry. That seeds may be improved by the proper help of man is proven by the success of Mr. Rogers, of Massachusetts, with grapes, as his long list of hybrids of high class are in evidence; so of Mr. Munson, of Texas, who also has a long list of valuable grapes, but, unfortunately for us, neither is up to our need of hardiness. Now Mr. Patten, of Iowa, is working to grow apples and other fruits hardy for the colder north, and he has been very successful, but has not fulfilled his desire in that direction.

I have made a small beginning in raspberry fertilization, in crossing the New Cardinal with the Loudon both ways, and the few plants so saved show in a wonderful and distinct way the parentage in every plant; what the fruit will be I may be able to know another year. I have also saved seed of apples the same way. In trees two years old they show their parentage very clearly, so much so that it encouraged me to save more seed this year produced in the same general way, by cross-fertilization. I have the seeds labeled as to the kinds, and will mark them as they are planted, so as to have correct data to work from.

At the Missouri State Horticultural Society I saw several seedling apples of fine appearance; three-fourths had a strong resemblance in some way or other to the Ben Davis or Gano; if that is the parentage, that would indicate where good fruit might come from. One apple in that list was evidently of different parentage; it was of large size, good shape, fair color, but of the best quality, and indicated good keeping quality; should that all prove true and it be also productive, I would rather pin my faith to that apple than to any I have seen. I would think my farm none too good to plant entirely to that kind.

One thing I wish to urge on all fruit-growers is to cultivate the orchard late in the fall, after the leaves drop; or, when possible, during winter, to kill the chrysalids of the many insects that pupate there in safety during winter and are ready to destroy the fruit in summer. Summer cultivation will not avail for them; I have tried this enough to prove its value. The curculio is our most serious insect in the orchard. They stay in the ground during winter. To plow shallow, or in any way to cultivate the soil shallow, will bring them up where the birds will find some; others will dry in the air; others may be broken in disturbing them; other insects may also get caught that are not helping us to raise the best of fruit. The disk harrow is one of the best implements for orchard culture; it will pay any man who has an orchard to own one. This late culture can be done with a common harrow, if the soil is not too compact. It should be used during mild days in winter to help the soil; I think it will pay better than the same time put in during summer, and I would prefer to do less in summer and more in winter. If all would try this I feel sure they would not omit it in the future, and they would complain less about the second-grade apple crop. Looking for the best fruit to grow, as free from insects as may be, should be our ambition.

### THE HOME GARDEN.

By J. L. WILLIAMS, of Wyandotte county.

There are several kinds of garden that might be called the home garden, but a paper on all kinds would take too much time and space for the present; so we will confine it to the vegetable garden for home use.

The vegetable garden on the farm is usually fertilized in winter with barn-yard litter of the past season's accumulations, and when warm weather comes the ground is all plowed and planted at one time; not only the early and late vegetables, but the hardy and tender kinds also; and only one crop is raised that season. But in cities, where space is limited, it becomes necessary not only to highly fertilize, but to plant with care, and raise two to three crops on the same ground each year. All gardens should have rhubarb, asparagus, onions (planted the autumn before), and parsnips. These, coming early, before anything else, can be gotten ready for use. We had one garden, 35x80, feet, which was a clay hill graded down several feet below the surface, and which would have made good brick. In 1900 we put on this ground 130 wheelbarrow loads of fresh stable litter, and raised on part of it two, and on part three, crops of vegetables of good quality. In 1901 we put on 105 wheelbarrow loads of litter as before, and on part we planted early potatoes the usual distance apart, and between the rows early peas, radishes, onion-sets, beets, parsnips, beans, lettuce, and cucumbers. The balance of the plat was planted in sweet corn. After it was ripe a crop of turnips was raised. After the potatoes, peas, beans, lettuce and cucumbers were off, the whole was planted to tomatoes, and, notwithstanding the unfavorable season, we never raised a better crop of tomatoes, it being the third crop raised on the same ground this year.

Cabbage can be raised as a first crop, or after two other earlier crops have been taken off. Sweet potatoes will occupy the ground all summer. Tomatoes that are not ripe late in the autumn should be gathered and spread out in a dry, cool place, and will continue ripening for at least one month, and be nice and good flavored. Such vegetables for winter use as dry and shrivel should be packed in boxes or barrels of dry dirt and placed where they will not freeze. Any family which has one or more lots can and should at least raise a part of the vegetables needed for their own use.

## HORTICULTURAL PRODUCTS FOR ARMY AND NAVY.

By COL. WILDER S. METCALF, of Lawrence.

The subject now before you is "Horticultural Products for Army and Navy." If an examination be made of the ration furnished the army and navy of the United States, it will be found that a very considerable as well as an absolutely essential portion thereof consists of what may be termed horticultural products. Meat, of course, is a necessity; and it is being demonstrated that a plentiful supply of fresh meat is a wholesome and necessary part of a soldier's diet, even in a tropical country. But equally important, and especially palatable and wholesome, are the fresh potatoes and, of course, the beans. Beans have been so long recognized as a vital part of the ration that some beans are known the world over as "Navy" beans. Likewise many of you will doubtless recall some jingling lines, which it will not be necessary to quote on this occasion, in praise of the army beans. It may be well to announce at this point that our knowledge of this subject is more personal than practical—more the result of experience than of extended research.

The United States army and navy of to-day have no such experience of hunger and hardship as was had in 1861 to 1865. Food of all sorts is wholesome and plentiful as well as regularly supplied. The American army and navy in the Philippines, 10,000 miles from home and its base of supplies, is unquestionably the best-fed army and navy ever known in the history of the world. Matchless Australian beef and mutton are usually delivered to the remotest lines several times each week. Fine fresh potatoes and the never-to-be-neglected beans, all grown at home, are shipped across the vast expanse of water and issued to the army and navy in the orient with comparatively little loss. Onions, also, a wholesome, fragrant and unjustly tabooed delicacy, are issued frequently. No more appetizing or satisfactory meal was ever eaten by the present speaker than raw slices of those same onions, with hard crackers and salt. Such a meal seemed to put new energy into wearied bodies; new red strength into pale, thin blood; and fire into burned out hearts; to say nothing of hot fragrance into each panting breath. Rotten potatoes and desiccated vegetables will not be mentioned in this address, as little or no experience was had with them. In their stead was had an abundance of canned fruit and vegetables, the purchase of which was always made possible by the savings of flour and vinegar and other articles of the ration, and always to be had from the stores of the commissary sales depot accompanying the troops within reaching distance.

But little can be said regarding horticulture in the Philippine islands. Horticulture means work, and work is something to which the native of a tropical country is traditionally and constitutionally opposed. Abundant fruit and some vegetables appear to grow spontaneously, and are to be had for the slight exertion of gathering. There was a yam or a sweet potato sometimes rudely cultivated, a small amount of very poor corn, and a root like a radish or turnip, sometimes found in the miserable gardens, and eaten by the army with scant relish. About the only fruit systematically raised seemed to be the banana, found in little groves near the better class of houses. This fruit is found in many varieties, and runs from small to enormous in size; and from poor and indifferent to excellent in flavor. There was an abundance of other tropical fruit, usually growing wild, without care or cultivation of any sort: the delicious mango, the king of tropical fruits, growing on large majestic trees; the peculiar, sweet chico, looking something like a russet apple or a rounded seckel pear and tasting like neither; the tomato-like pomelo, much liked by many. There are

also an abundance of cocoanuts and pineapples. The guava is also found, well known as making most delicious jelly. There are numerous berries and nuts, some edible and some eminently not so. The soldiers of the Twentieth Kansas will never forget one extremely attractive berry found on some trees near a house in San Fernando de la Pampanga. This fruit was beautiful to look upon and pleasant to the taste, and was therefore partaken of most generously by the men of one company which happened to be camping near the trees, with the somewhat alarming result that the entire company was within thirty minutes distressingly sick and disgracefully unfit for duty. Happily the effects rapidly passed away and left the men seemingly none the worse for the wear and tear, and very much wiser in regard to the proper uselessness of the fruit of at least one tropical tree. There are also lemons and limes, and sour, scrawny, ill-bred, uncultivated oranges.

We must not forget the many beautiful flowering trees: the peculiar flaming blossom of the fire-tree, presenting with its mass of blossoms a truly startling appearance from a distance; the wonderfully fragrant ylang-ylang, the source of one exquisite perfume and the base of many others. These beautiful, delicate, white blossoms, gathered by the natives and strung in long garlands, are eagerly purchased on the streets by the foreigner and wealthy native. And so, with the abundant home ration, supplemented by the varied fruits of the tropics, the army and navy lived well. The fact of the matter is, after all, that man's enjoyment of something to eat depends more on his appetite than on the variety or abundance of the food available, and man's appetite depends largely upon his habits and mode of living; and this brings us to another thought.

Horticulture, as we understand it, is the intelligent scientific cultivation of plants and trees, for the purpose of producing flowers, vegetables, and fruits, either for decoration or food, and for either pleasure or profit. There is, perhaps, no one thing to which the present speaker has given less thought in the past twenty-five years than horticulture. Some one has said that it is better not to know too many things than to know too many things that ain't so. This may account for the presence of one speaker on your program. But we do not feel entirely incompetent or out of place, for during the first twenty years of our life we were giving this subject a great deal of attention.

Our paternal ancestor was a horticulturist of considerable local reputation. In his home place there were ten acres of excellent land, in the outskirts of a growing young city in northern Ohio. The family consisted of eleven sturdy boys and a few girls. These boys were given a thorough and well-considered twenty-one-year course in horticulture, the advantages of which were not at the time fully enjoyed or appreciated, the course being, in a measure, compulsory, and interfering frequently with other pursuits more congenial. However, we still remember the absorbing interest with which we watched the careful preparation of the soil of the garden, and how we enjoyed sorting over the various packages of seeds and the careful planting thereof. We knew which seed should go in trenches and which in hills, and which should be covered deeply and which lightly. We watched daily for the first appearance of the tender leaves and rejoiced in the marvelous growth and development of each little plant. We cut the seed potatoes, being careful to get eyes in each quarter. We dug in the earth and found and wondered at the shriveled seed potato giving its substance to nourish the growing stem. We watched with intense interest the forming pods of the beans and peas; we cleared and prepared the early vegetable ground and planted the attractive little turnip seed. We know how to cut and trim brush and make supports for the peas and tomatoes. We were taught to



drop the kernels of sweet corn five in a hill, and as we dropped the corn we sang the now scarcely remembered ditty, running something like this: "One for the chickens, one for the crow, one for the grubworm, and two to grow."

We remember well the pulling and hoeing of the fast-growing weeds, and our struggle to keep them down, and our pride in the clean earth, free to give all its nourishment to the growing vegetables. In the intervals between school hours, and in the long, pleasant days of the summer vacation, we often worked with bitter hearts, feeling that we ought to have, more often, the usually recognized right of boys to go fishing or swimming. We remember, also, the wondering interest with which we watched in the orchard the process of grafting; the preparation of the graft and of the notch in the limb to be treated, the skilful setting of the graft in place, and the sticky bandage with which the wound was dressed. We recall the curious slit prepared for budding; the bud with its bit of parent wood; its careful insertion in the slit, and that same sticky bandage. How we watched the growth of the bud or graft until the scar disappeared and it was almost impossible to tell where the wonderful cross-breeding took place! We remember the first green fruit, and the usual experience of boys with green apples, pears, and peaches. We never forgot the first ripe apples, the Early Harvest and the Red Astrachan. We knew the names and qualities of the various apples, and peaches, and pears, and grapes. We climbed the apple trees and picked with tender care the fall and winter apples. We prided ourselves many a winter evening on our ability to tell the varieties of apples by the sense of taste alone; we recall the great map on which our father had indicated the location and name of each of the several hundred fruit-trees on the place. We had our favorite Bartlett and Seckel pear trees, Golden Sweet, Sweet Bough, Russet, Rhode Island Greening, Porter, Belmont, or that particular favorite, that prince of fall apples, the Rambo.

In short, the boys knew something about horticulture because the respected ancestor before mentioned had a theory that there was a close and intimate relation between the raising of good fruit and vegetables and the raising of a good family of boys. The enforced application to duty, the having a definite something to do, developed the habit of industry and the love of work; the boys grew and thrived with the trees and the garden, and now we bless that wise paternal ancestor daily for his knowledge of horticulture and his interest in it, and for his masterful grasp of the wise and beneficent connection between the growth and training of vegetables and trees and the growth and training of boys. The love of work and the habit of industry are of inestimable value. Idleness and lack of responsibility are a terrible mistake in the life of any boy. Let me urge the fathers here present to bring up their boys to work; to have something definite to do each day. You may well praise God for the time when, with them, work becomes a habit; when idleness becomes impossible; while in their thoughtless youth they may complain and think hard things of you, take the word of a grown-up boy that the time will come when your boys will understand, and will bless and honor you all their lives for forcing upon them the priceless habit of application and industry. Did you ever think that the youth of Kansas are perhaps fortunate in their environment?

The withering hot winds, the long seasons of record-breaking droughts, the sudden changes from balmy Italian air to a bitter, six-below-zero blizzard, the occasional magnificent rains, all have helped to make our wonderfully productive soil. The constant struggle with the fitfully changing elements, the some-time affluence and the oft-time lamentable poverty, all tend to develop men. Exposure to the cold of our short, severe winters and the hot sun of our long summers

develops strong constitutions. Stern necessity develops habits of industry and application. The whole history of our magnificent state, the conflicts with the Southern pro-slavery squatter in the fifties, the glorious record in the civil war and the never-ceasing struggle with the soil and the elements have helped to develop strong, aggressive, intelligent, far-seeing, all-conquering men. Keep up your good work, then, horticulturists of the state of Kansas, and remember always the plain connection between your boys and your business.

## BIRDS.

By EDWIN TAYLOR, of Edwardsville.

Perhaps it may not be out of place for me to observe, in the outset, that the classification I have used in the study of birds is not that of orthodox ornithology. As an ornithologist I am a "come-outer." Pliny classified birds according to their feet. Albertus Magnus counted all flying things, bats, bees, mosquitoes, etc., as birds. Francis Willoughby grouped birds into land fowl and water fowl. Bird classification has been worked out more than a hundred different ways by ornithologists; and, finally, when Alfred Newton classified them according to their teeth, I "left the party" and came out upon a reform. My bird book is not yet printed; when it is, it will separate birds into two great divisions: high flyers, *alta volantes*; and low flyers, *volantes vulgare*. This division is fair to both factions. The high flyers may be superior in point of numbers, but the low flyers are the best sellers. The high flyer is brought down out of space by the discharge of murderous ordnance, while the low flyer is beguiled off his perch by a hot board or slim hook. We put the high flyer into our poetry, and the low flyer into our pot-pie.

The question about teeth in birds gives me no concern. After a considerable amount of original investigation, I am able to say they do n't have 'em—not now. In the beginning they may have been less innocent. That familiar figure of speech, wherein sparse or infrequent things are compared for scarcity with hens' teeth, is doubtless a relic of past periods, carrying with it plainly that there *was* a time when the hens wore dental adornments. Hunting the eggs was no light matter in that prehistoric age, when a hen had a nip like an alligator; and supposing all the low flyers to have been equipped in proportion to their size, we have an easy explanation of the phenomena of wild turkeys—to let them run wild was the only safe way to do, and, such was their persistence, that a remnant of the race, long since become toothless, was still at large in the early days of Kansas.

There is abundant evidence that mankind was early alive to the importance of birds. From time immemorial man has refreshed himself upon their eggs and flesh, and made soup of their nests. A supper of hot birds is the same gastronomic high water mark in our time it was in the time of Alexander. When the Pilgrim fathers invented Thanksgiving, they prepared for it, as Governor Bradford observes, by sending "four men forward fowling, that we might give thanks more abundantly." And to this day Thanksgiving do n't count unless a certain low flyer has a part in the proceedings. What is true of the youth belonging to our race is also largely true of the race in its youth. The child delights in noise and bright colors; so did the aborigine. The boy does n't care what the pigment upon his playthings may be so long as it is red. In like manner the bright hues of the birds that wore the loud patterns early attracted his savage ancestors; and the cozy comfort, in chilly weather, attendant upon disporting a vest of gaudy bird skins, as a matter of style, first suggested to our untaught progenitors

the idea of a wardrobe for warmth. Give the boy materials for drawing, and his first attempt at the pictorial art is likely to be a bird; and accordingly, as my analogy would suggest, we find that the very oldest picture extant, dating from a time anterior to Thebes, is a representation of birds.

The great difference between the theologian devoting himself to what is known as the higher criticism, and scientists like ourselves going about the higher criticism of birds, is that, in the first instance, the critic is up a tree (or stumped), while in the second the bird is up the tree. It results in the scientist having a more satisfactory job than the theologian. I have spoken of the poetic inspiration birds have furnished, but their contribution to economic investigation is not less important. Not all of Adam Smith's canons of taxation taken together are more often quoted or received more universal acceptance among economists than that ornithological maxim which goes unquestioned in every banking-house in this country, viz.: "A bird in the hand is worth two in the bush." Some curious calculations may be made upon the changing values of birds as affected by their change of location. Taking, for instances, as a basis for the tabulation, the recognized formula just quoted, that when a "bird in the hand" is represented by the numeral one, and the same bird, when removed to the distance of the nearest bush, suffers a depreciation in value represented by the fraction one-half; then we find, by a computation carried to the ninth decimal, that a further removal of the bird from the bush to any tree whatever diminishes the equity remaining in the bird, approximately, according to the square of the distance from the bush to the tree.

Owing to the uncertainty of tenure attaching to birds, it has come about that much of the law respecting them has not been included in the revised statutes, though in great measure it is nevertheless held inviolable. For example, practically all people recognize the binding force of this extrajudicial dictum, "You can't catch old birds with chaff"—an enactment that would not be strengthened if the language were changed to "You *sha'n't* catch," etc., or if it were re-enforced by a constitutional amendment. The use of the word "old" in the above citation has in some instances resulted unfortunately, because, "old birds" alone being mentioned, young birds are by implication exempted from the operations of the act, and the unwary have from time to time jumped to the conclusion that chaff might be sufficient bait for birds of immature development. The state, however, is not responsible for the ambiguity in the language used, the court having held, in the case of *Shorty v. Wren*, that no bird is assumed to be a young bird or a "fresh" bird except at the risk of the sportsman himself; and that while the hunter may with impunity spread chaff, he does so "at his own risk" and "at his own proper cost and expense," and, in case of failure to catch anything, is barred from action for the recovery of costs. The poet happily came to the rescue of the lawmaker when he translated this sound principle into his own more sound language, thus:

"Decortications of the golden grain  
Are set to allure the ancient fowl in vain."

Nothing better illustrates the progress of science and the faculty of the youth of our time to catch on than the growing infrequency with which the up-to-date young person attempts the impossible feat of apprehending the feathered denizen by the inadequate expedient of throwing salt on his tail. Though the present writer has continuously kept a sharp eye out for repetitions of this experiment, there has not come within the range of his vision for a considerable time, now, what he not infrequently beheld in the juvenile portion of his existence, viz., a

small boy with a bucket of salt, an agitated countenance, and an alert step, hopelessly trailing a flock of quails.

In the order of their evolution, birds are plainly the connecting link between animals and fish. Fish undoubtedly came along first. In the course of time the more ambitious among the fish found that they could rise up out of the water somewhat, and they worked away at it till they began to develop wings out of their fins, and before you knew it they were actually flying—become “glorified” fish, so to speak; indeed, we still have the flying-fish, making the half-way station in the game of progression. These flying-fish stay in the water mostly and in the air a little; the taste for air and the habit of flying grows on them as they advance in years, and they pass easily into the next class, the water-fowl, which stay in the air mostly, and in the water but little.

Some of the reformed fish having permanently changed, from time to time, their habitat from water to air, and expanded their fins into wings and their scales into feathers, have been still further forced forward by the same spirit of progress that first drove them out of the water—the same that impels the young man to go West; and finally they set about changing their wings into front legs, their feathers into fur, becoming animals. There is a shadow of authority for the position that they crossed over by the squirrel route. Some squirrels have n’t quit flying yet, and away back they probably flew so much that the common people still speak of them as “birds.” Color is given to this view by an ancient inscription discovered at Nowhere, running about like this:

“The squirrel, he is a pretty bird;  
He has a bushy tail;  
He used to steal old Grimes’s corn,” etc.

At the “etc.” point the inscription becomes illegible, but it is considered of the greatest value to antiquarians.

One of the curious features of bird lore is what may be called ornithological symbolism. From the earliest times men have expressed themselves in terms of birds. The distinctions therein are so marked and of so universal acceptance that they amount to a common language.

This symbolism is as arbitrary as the Arabic numerals. It is not surprising that a single downward stroke of the pen should have been taken by the Arabs to represent one; but by what possible hypothesis did they make two strokes stand for eleven? There is no rational answer. It is equally inexplicable how it has come about that the thrifty goose, of whom the spare, diaphanous poet sings:

“I wish I were a geese, all forlorn;  
They accumulate much grease, eating corn,” etc.;

that this personification of thrift, which can give odds to anything that wears feathers in shoveling up grain and profiting by it, has been set down, since Homer, as the type of foolishness and unthrift.

On the other hand the warlike duck is thus celebrated in rhyme by a famous Irish poet:

“The foineest burrid in the wurrid for a foight,  
Barin’ the agle, is the duck;  
He has such a foine large bill, to peck;  
And plinty of Oirish pluck.  
And thin d’ye moind the fut he has?  
Sure, its as large over as a cup;  
It puts him in the heavy-weight class—  
All nature can’t thrip him up.”

This belligerent duck, I say, by some curious perversion of resemblances, is a universal symbol of affection, or at least of tender admiration.

The mule to the horse, the cat to the catamount, are not more nearly allied in form and feature than the goose and the duck. They have the same open countenance, the same vibrant voice, the same knee action; and yet so differently are they regarded that a comparison with the one will set soft hearts to palpitating, while a mere intimation of a resemblance to the other will set the patent kicker to knocking.

So far as the records in the state library show, there is no language in the world in which the word "duck," applied to a female young woman by her "steady," is not regarded by herself and her mother with secret approbation; and when used in the diminutive, as "ducky," particularly in combination with the equivalent for our word "darling," as "ducky darling," it makes a plaster so drawing that gentlemen with a tendency to the breach-of-promise disease are urgently cautioned against its use.

But the most notable symbol furnished by any bird lies in the significance that attaches to the white-winged dove—the emblem of peace.

From the standards of many nations, antedating the Romans, and continuously since their time to the present moment, the eagle has looked down upon the carnage, the cruelty, the rapine, the destruction of war; upon its widows, its orphans, its distresses, its desolate homes, its bitter tears, its broken hearts, its atrocities unspeakable—victors and vanquished alike accused. It passes comprehension that the eagle should still be a dominant figure in the hearts of men. To the blasting influence of this malignant fowl, I oppose the bearer of the olive branch—the bird of harvest, the harbinger of love, of order, of domestic joy, of security, of infancy unharmed, of youth unalarmed, of gardens uncrushed, orchards blooming instead of ruined, of milk and honey and sheepfold—the dove.

Some day, please God, the dove shall enfold all the earth beneath its broodings, and the hateful scream of the war eagle shall be heard no more. May I not bespeak for this Society that its voice and vote shall be cast for the dove?

### BEST HORTICULTURAL IMPLEMENTS.

By FRANCIS GOBLE, of Wallula.

My duty before this Society at the present time is to discuss, in my own way, the best horticultural implements, and, the apple being king of all fruits, I shall proceed to discuss its cultivation; and its cultivation, as I shall discuss it, will apply in a great measure to the cultivation of horticultural products in a general way.

In the eastern third of Kansas we have an excellent farming country for corn, wheat, potatoes, etc., and the timbered portions of these lands are especially adapted to the growing of high-grade apples. These lands are so highly prized for this purpose that much of their domain is being planted to apple orchards, and we are happy to say that some of the largest apple orchards in the United States are found here. The soil varies in different portions of this section, from mulatto to black loam, with clay subsoil, which makes a splendid fruit soil. There is generally plenty of rainfall during the farming season to produce excellent quality, size, and shape, and bracing southwest winds during ripening season to produce plenty of color, which, when combined, make one of the highest grade apples. This class of apples, when properly sold, brings the highest price.

In preparing for the planting of trees, we usually plow the grounds in the fall as deeply as possible with any ordinary turning plow, and when spring arrives we chop them again as thoroughly as possible with a twenty-inch disk harrow, lapping the harrow half each round, which, when finished, leaves the surface in the

best possible condition for planting; we then lay off furrows with any ordinary turning plow or lister both ways, rows running north and south thirty-two feet apart, and east and west sixteen feet apart. After this, if considerable planting is to be done, we use two listers of largest size, each drawn by three large horses, one after the other, to open the rows deeply. This work is rapidly done, and at this point a man with a wagon containing trees carefully puddled drives along and places one at each cross. The trees are taken up by a sufficient number of men, formed into crews of three each—a tree-holder and two shovelers; the loose dirt is lifted from the bottom of the cross by the men with shovels to the proper depth for planting, the tree placed by the third man into the cross, with the top inclined slightly to the southwest; a good class of soil is shoveled in upon the roots of the tree, which is carefully tamped by the third man or tree-holder; and as fast as rows are finished in this way a man with a team and turning plow is used to turn back the soil to the trees in the listed furrows. As soon as the trees have been planted in this way the men are required to go back over the grounds and tamp all trees to their proper position. In this way a large orchard may be properly planted in a short time with a medium-sized crew of men.

I prefer two-year-old trees, strictly first-class, with uniform bodies and tops, and plenty of roots in good condition. If any roots are materially bruised it is best to remove the affected parts, and in order to get a uniform set of plump tops we think it best to cut back to an egg shape. After a lapse of a week or ten days it will be important to stir the ground about the roots of the newly planted trees. This cultivation may be done by the ordinary double-shovel plow, a five-tooth cultivator of any kind, or any one-horse cultivator of even more shovels or teeth. If the condition of the ground is mellow and the weeds quite small, the Buffalo-Pitts new diamond-tooth spike cultivator, with fourteen small shovels or teeth, or any similar implement, may be used to good effect in pulverizing the soil and the keeping down of the weeds.

If the weeds get a start, however, we know of no better plow or cultivator than the ordinary double-shovel to lift up and give life to the ground about the trees. When lands are strong enough, it is admissible to plant corn, Kafir-corn, sorghum, potatoes, etc.

It will be best to plant corn after the lister, also the Kafir and sorghum; but rows for the last two named may be much closer than for corn and much more shallow, but allowing subsoiler to run deeply. Any ordinary one-horse corn-drill will answer for planting these crops, but care should be taken to secure a special plate from the implement dealer or nearest blacksmith for cane or Kafir. It will be important to cultivate the corn in a good, businesslike manner, also the Kafir and cane crops at least twice, in order to level up the grounds nicely, and in this way excellent crops can be grown.

Among the orchard lands of medium strength millet may be raised to good advantage, and the thin or poor lands may be planted to cow-peas or soy-beans, which are very helpful to them. Through their plants the grounds are able to gather the nutritious gases from the air that are so beneficial to plant or tree growth. Men experienced in the growing of these two crops say that, as a fertilizer to lands, they are nearly or quite equal to red clover. They also make valuable forage crops for stock, yielding at times as high as two and one-half tons per acre. In farming the lands in the crops above mentioned, excepting the two last, it is important to keep them back from tree rows at least four feet, and this space along tree rows should be thoroughly cultivated from time to time until August

1, and should then cease, so that trees may have an opportunity to ripen up their wood and get ready for winter.

The above-named crops are among the most important to use in the cultivation of young trees, as their careful cultivation serves to keep down injurious grasses and excessive weeds that would be injurious to the trees, and they also leave the grounds in a more open and porous state, which is the preferable condition for trees of any age. Kafir-corn and sorghum crops raised as above described should be harvested with the corn-binder, as this delivers it in the simplest form to place into the shock, and also the handiest condition to feed to stock.

After cultivating the orchard in this way five or six years, it will be best to seed down to clover. Remove first crop each year from grounds and use for cattle or stock of any kind, as this will prevent the smothering out of a large per cent. of the young plants and aid in a longer continuation of the sod. The mowing-machine should be run over the grounds at least once more during growing season, say about August 1, in order to smooth the surface of the land among the trees and to give the freest possible circulation of air and sunshine, which are so much needed at this time for the proper coloring of the fruit.

The pruning-knife and saw properly used are also tools very important among our orchards, and their use should begin with the planting.

Immediately after the tree is properly set in the orchard-plat the top should be carefully shaped, and this feature carefully kept up throughout the lifetime of the tree. It should not be allowed to go until the top has grown large and bushy, as a condition of this kind would require entirely too much cutting among the large branches to reduce it to its normal size. To do this would endanger the longevity of the tree, by bringing about decay and ultimate death.

When we pick up reading-matter upon the subject of horticulture, we too often find where some orchardist or orchardists have had a large percentage of their crops destroyed by various insects which seem to be increasing, and the cry is often, What shall be done? You ask them if they have sprayed their trees carefully; many will say Yes. You ask if their trees are of the productive kinds, and they say Yes. You ask about their slopes and soils for the business; they will say they are all right. But when you ask about their mode of cultivation they are generally at a loss to answer.

Upon investigation, you find, perchance, fifty to eighty large, bushy trees per acre, thoroughly matted with grasses, weeds, and rubbish of all kinds, with an intersprinkling of sumac, box-elders, dogwood, elm, etc., which makes one of the most extraordinary nesting-places for the mother insects of all kinds upon the face of the earth. An orchard in this condition is not only a detriment to its owner but to the entire neighborhood that contains it, and I am frank to say that we should have a law prohibiting orchard conditions of this kind. An orchard of 160 acres kept in such a manner is competent to produce enough injurious insects to destroy the apple industry of a whole neighborhood.

A condition of this kind should be absolutely avoided; and in order to do this commence to prune and shape top at time when tree is set, and keep it up, pruning in such a way as to keep top inclined upward, and cultivate from time to time as needed, say with turning plow, by plowing both toward and from the tree often enough to keep the grounds from becoming matted with injurious sods of any kind, and to keep them from becoming too compact or solid. At the proper time, after the orchard has been plowed as above described, a disk harrow can be used to good advantage in chopping up and pulverizing the soil, and should be reversible, so as to throw dirt to or from trees, as desired. This should be followed by any ordinary harrow, for the purpose of leveling up the lands.

In the above we have undertaken to show the kinds of implements we use and think best for planting and growing trees of all ages.

## BEST HORTICULTURAL IMPLEMENTS.

By CHARLES HARRINGTON, of Altamont.

With the advance in horticulture, taking yearly a higher place in the world's work, we are demanding special and better implements, and the ingenuity of the inventor, as well as the skill of the manufacturer, are required to meet the demand. While the number of soil-working implements is legion, the types are few. The plow, the cultivator, including the harrow and the hoe, about complete the list. For the first work in the spring, I think nothing as yet equals the plow, turning the ground shallow, and from the trees or vines, and finishing the work with one horse and a lighter plow. For the rest of the season, the spring-tooth, disk or cutaway harrow will answer all purposes, provided they are frequently used. Not having these better tools, one need not despair, as a common cultivator, one- or two-horse, or a common harrow, will do good work; with the latter, use handles or some method of guiding it, that the tree be not barked. The orchard disk, made to extend to one side, to run under the trees, is, of course, very desirable. The two-horse cultivator, with knife shovels, will please you. But the finer the implement, the more constant and thorough must be the work.

Hallock's weeder is fine among the berries; but you may have to supplement its use with a plow or old-fashioned cultivator. I use the five- or seven-point extendable cultivator, and like it very much. I like to use one horse next the row, both with trees and vines, thereby virtually hoeing them. Use a short-singletree, wrapped next the row with heavy cloth. Planet Junior horse-hoes will do good work for you, as will the wheel-hoe in your little stuff. We cannot yet discard the common hoe; I think the simple type is best. In hand-weeders, Hazeltine's and Excelsior are excellent. The saw and shears are all that are needed in pruning. The sprayers using liquid and muscle seem safest and best.

But enough. I would only say in conclusion that my observation has led me to believe that, to render our improved implements effective, they must be kept in good order, must be frequently used, and the handle attachment (the man behind) must be the best. The time is not yet in sight when we can dispense with either hard thinking or hard work, but a fruit man who does not have the latest improved implements may yet do thorough work, excellent work, with a common plow, a common cultivator, and a common hoe.

## IRRIGATION.

By H. E. GOODELL, of Tecumseh.

In bringing this subject before you, I am reminded strongly of the familiar adage, "In time of peace prepare for war." For, although our fair state is not calling very loudly for irrigation at this time, not many moons have passed since "sunny Kansas" was indeed a dry state. I suppose some of us who have heretofore hardly given the subject of irrigation a thought, or perhaps but little attention, are now considering the subject with interest. I shall not attempt to deal with this in a general way, or report the satisfactory results obtained by many, but will give you a little of my own experience, after having tested the matter.

"The proof of the pudding is in chewing the string," always, and I know of no undertaking where theory is knocked out by practice any quicker than in irrigation. My irrigation work has been on orchard and strawberry bed exclusively. Have a twelve-foot, back-gear steel windmill on a forty-foot, three-post tower, using two pumps, an eight- and a four-inch, both running nicely with a



good wind. When the gentle zephyrs blow, by removing one bolt from coupling in large pump rod, can use the small pump, this furnishing a constant supply of water. The capacity of pumps at best is ninety gallons per minute. Water is lifted twenty-four feet and delivered in reservoir located beside the mill; the dimensions of said reservoir being 70x170 feet. The inside centers on a light, sandy loam, scraped out to carry two feet of water below and five feet above, being oblong in shape. Have a tight board fence around inside of reservoir, to keep the waves from washing the bank. For outlets, I use four-inch gas-pipe running horizontally through the bank, level with land on outside, with elbow, and with five foot stand-pipe on inside. This should be placed in such a way as to be tight when upright, and can be leaned over or laid down as desired when in use. [Turns on elbow.] This outlet has given perfect satisfaction. We tried the square, plank trap-door outlet, but it was a nuisance, and was discarded.

An item worthy of mention is that of fresh fish supplied to our table and that of our friends from the reservoir, it being stocked with catfish, which, aside from their toothsome-ness, are of great value in keeping the pond from seeping, their activity keeping the sediment constantly stirred up, and it is naturally drawn to the spot needed. Have used the open-ditch plan of distributing water until this year for several seasons. This has not been entirely satisfactory with strawberries in fruiting time; not knowing when nature is going to take a hand in the irrigation business, the berries must be well mulched, for clean fruit; this retards the water, running it where it is not needed, causing a waste of water; the gophers and moles get in their work, making it necessary to tramp around in wet soil, stopping up this hole and that and shifting the mulching; and, using all possible care, this is damaging to land and plants.

I am of the opinion that strawberries, to do their best, should be watered often, but in homeopathic doses, which is hard to do by the flooding system. However, I have arrived at this conclusion, partly from the excellent and I think better results obtained from the use of a tank wagon this season in my orchard and berry patch; being forced to economize in the use of water, my reservoir not being in first-class shape for filling to full capacity, as the time which should have been given to that work was used in building a house to live in, our home having been destroyed by fire in early spring. This misfortune, followed by the severe drought, will make the year 1901 long to be remembered by the writer. Being short of water at this most-needed period, the idea of using a tank occurred to me. Thirty feet of hose was attached to the tank wagon, having a coupling in the center, for convenience in watering the row nearest the wagon. By using every sixteenth row as a driveway, water was run from the open hose on the fruit and plants, leaving the middle of the patch in good condition for pickers. Some protested I would ruin the berries by watering in the hot sun, but I failed to see any bad results; on the contrary, a marked improvement was noticeable from the first, both in foliage and fruit, the season of picking being much lengthened as well. I expect to improve upon the method of getting water from the tank, and will substitute pipe for hose.

The single hose works well in orchard; gave each tree about one-half barrel of water, following it next day with hoe or some light cultivation to loosen the soil and keep it from baking; this being sufficient for about two weeks in any kind of weather; and it was certainly a refreshing sight to see those trees putting out new leaves and sending out new shoots, after the good drink given them, and also to see how those apples stayed on instead of covering the ground. Certainly every horticulturist in the state could profit largely by the use of a water-tank in orchard alone, as the results are all that could be desired, and I believe will

pay well in any season. This year we ran short of water. It takes, in a dry time like last summer, a great amount of water. I took a tank wagon and a one-and-one-half inch distributing hose, and ran out about two barrels of water for every fifty rods of row. They should be watered every day when it does not rain.

### VARIATION IN FRUITS AND PLANTS.

By W. E. RINGLE, of Independence.

It is evident from such facts as I have been able to collect that biologists are persuaded that all living organisms tend to vary even under the most uniform conditions of environment. There seems to be an innate disposition for organisms to evolve—to perfect their organization—apparently without the assistance of external influences. We have great reason, therefore, to expect surprising variations in living organisms when they are subjected to different environmental pressure and to the influence of external agencies. It shall be the purpose of this paper to point out some of the causes of plant and fruit variation and to show how the horticulturist may control this variation and make some progress towards reaching his ideal of fruit and plant.

The laws of variation are infinitely complex and diversified. Any disturbance that may affect the plant may also affect the seed or embryo, and any change in the embryo may be transmitted to the future plant produced from this seed. There seems, therefore, to be no limit to variability. It may go on forever.

Progressive adaptation to environmental influences is a law of life. It is practically impossible to place two organisms under exactly the same conditions. In the case of seeds, some may be planted deeper than others. The seeds themselves may differ in size, some furnishing more nutrition than others; some may have thinner hulls, or the hulls of some may have cleavage lines which may accelerate germination. Some of the seeds of the same capsule may differ in the time of maturity. The internal mechanism of the plant organism may cause it to be extremely sensitive to differences in the intensities of external influences; and when these external influences are of such a nature as to affect the protoplasmic structure of the germ-cell the law of progressive adaptation to environmental influences will assert itself and the plant will change its habits, and this will lead to profound modifications in its structure.

Sufficient intensity of external stimuli to produce this effect may arise from the conditions of the soil. Two seeds may be planted in close proximity, but the soil surrounding the seeds may differ in chemical composition quantitatively and qualitatively. It may differ in degree of temperature because of this difference in composition, or because of the position of surroundings. It may differ in moisture and in compactness. Any of these conditions may be sufficient cause to produce variability in the two seedlings. Biologists seem to think that the center of extreme sensitiveness of plants is in the reproductive system, which they claim is eminently susceptible to every slight change in the surrounding conditions; so much so, that so trifling a change as a little more or less water at some particular period of growth will determine whether or not a plant will produce seeds.

Buds, likewise, may vary because of their position on the branch of the tree. Some branches may differ in food supply, while some may give the buds a better exposure to air and sunshine, all of which may affect the life germ of the bud. Buds may also vary because of a better start in the beginning, as a result of some incidental advantage. They may differ because of sudden climatic changes, or

because they have been stimulated by high tillage. Buds on the north side of a tree may have an opportunity to adapt themselves to changed conditions and become more hardy, since they may survive a freeze by being thawed out slowly, while those on the south side may be killed by rapid thawing. Such conditions may result in marked variations. Bud variation may result from some circulatory disturbance. An eminent botanist claims that any external influence that will disturb the plant circulation may be transmitted to the individual life germs of the plant, the amount of disturbance being distributed unequally, depending on the position and nature of the buds, and may thus produce sports. If this is true, we have some clue to bud variation as well as seed variation, and may be able to account for some of the perplexing problems concerning the variability of lateral and terminal buds.

There are still other conditions which may affect the protoplasmic structure of the plant. Plant roots may be affected by light, gravity, moisture, soil material, and contact. These disturbances may be transmitted by circulatory disturbances to the different organisms of the plant, and thereby produce some marvelous variation. Leaves may be affected by moisture, evaporation, air, and sunshine, and these disturbances may affect the general structure of the plant. It is interesting to note that there seems to be an equilibrium and close correlation between the plant organs, and when one part is affected the other parts seem to yield to the disturbance until an equilibrium is established. All these conditions, then, and many others, may produce marked variations in plant and fruit.

This subject is too broad to be discussed in a twenty-minute paper. Any one of the points mentioned should require more time than that; and hence I am permitted only to give brief mention of some of the more striking causes of variation. This point I wish to emphasize, however, that varietal peculiarities in fruit and plants are not due to chance. There is a cause for each particular acquired or transmitted characteristic, and we should look for causes and master the situation, if we would be able to control successfully plant and fruit variation. We should remember that the pressure of the severe struggle for existence is a great factor in producing plant variation. An eminent scientist has said, and our observation will verify his statement, that "plants maintain a continual struggle with each other for the occupancy of the soil; a struggle whose conditions vary, not only with the changing physical conditions in the same locality, but with the dispersal of plants by various natural agencies to new localities, bringing them into association with new plants and with new animal friends and foes."

I have stated the fundamental factors in causing variation. I shall now attempt to show how the horticulturist may so control the potent agencies as to reach his ideal of tree and fruit. We should bear in mind that man cannot cause variation; that must be left to the agency of nature. Man can only expose the plant organisms to new conditions of life, but nature through her agencies can alone produce the variation. Man may assist nature by a careful selection and accumulation of varieties and by placing them in the proper environment. Man must be patient, however. Nature works out marvels slowly.

The horticulturist must not demand nor expect too much. He should work for one variety at a time or fail. This variety should be most nearly his ideal, and should be adapted to specific uses, as, for dessert, canning, keeping qualities, and shipping. We cannot get the maximum of numbers and largeness at the same time. Goethe says, "In order to spend on one side, nature is forced to economize on the other side." We must, therefore, be content to sacrifice, if need be, certain qualities for others which we may consider more desirable.

The most potent factor in variation is doubtless the fertilization of the plant.

This may be either cross- or self-fertilization. The former is resorted to for the creation of new varieties and the invigoration of old varieties; the latter sometimes becomes the means of fixing new varieties, and is sometimes a cause of deterioration of certain species. The laws governing the fertilization of plants are, then, most important for all horticulturists to understand. This subject is fraught with some difficulty, however, as some of our most eminent botanists are at variance upon the most fundamental points. But regardless of this fact, there are a few principles concerning pollination which are helpful to the gardener and fruit grower, and these the horticulturist should understand if he would be eminently successful, and be, as Mr. Kellogg says, "the first fiddler."

Suppose we are looking for an ideal fruit or plant, which as yet we do not find, and suppose we do not have any promising varieties, then what should we do? We must proceed to assist nature to produce new varieties in some way. How? By beginning to cross flowers and by planting the seeds produced. The resulting seedlings will be unlike. The operator should then select seeds from the plant tending toward his ideal, and again select seeds from their progeny, and from the progeny of succeeding generations, until his ideal is secured. This may require patience, for it may mean a long-continued and tedious process. But suppose, in time, we find the seedling corresponding to our ideal, what then must we do? We must proceed to propagate it by runners, grafts, or buds, and thereby fix the desired characteristics by a careful and judicious selection.

This process of producing variation is exemplified by the Kenoyer blackberry, which is a cross between the Early Harvest and the Kittatinny. Mr. Kenoyer says that Professor Van Houten, of Iowa, informed him that in crosses the mother plant most often gives the form to the new seedling, while the father plant gives the form to the fruit. Mr. Kenoyer has verified this statement in the origination of his most excellent blackberry. The Early Harvest, being the mother plant, gives to the Kenoyer plant its upright growth, while the Kittatinny, being the father plant, gives its characteristics to the fruit of the Kenoyer berry. These facts, together with constitutional vigor and productiveness arising from crosses, have made for Mr. Kenoyer a very desirable berry. We should, therefore, keep these points in mind. If we want to control the character of the plant, we should select our ideal plant to be the mother. If we want to control the character of the fruit, we should select our pollen from the plant bearing the desired fruit. In this manner we may be able to reach our ideal of plant and fruit.

Sometimes the horticulturist may desire an early or late variety of some desired fruit. In order to secure an early variety he should select seeds that mature first. These seeds should be new, large and full of nutrition. These should be planted and treated as those before, and the resulting variety will tend to be precocious and abundant but slightly smaller and less firm. Vigor, keeping qualities, size and firmness seem to decrease. If a late variety is wanted, late seeds to mature and old seeds should be selected.

It has been a common practice with horticulturists and gardeners to send away for seeds of the desired varieties, thus obtaining seeds produced for several generations under different soil and climatic conditions from those existing at home, and to use these seeds exclusively. A better result would be obtained by securing part of their seeds in this way, and the other part from a careful selection of those produced in the home garden. By sowing these in alternate rows, the two stocks will intercross, and by this crossing there will be obtained a thorough blending of their whole organization and no loss of purity to the variety—a far better product than by a mere exchange of seeds. Experiments of crosses

of this kind have been shown to improve the height, weight, hardiness and fertility of the plant.

If we wish to increase the constitutional vigor of any plant, we must rejuvenate and modify the offspring by means of cross-fertilization, thereby uniting the characteristics of two individuals. We should observe, however, that if a cross is effected between plants of the same variety grown in different localities and under *slightly* different conditions, the result is greater constitutional vigor; if between plants of the same variety grown under conditions varying very *largely*, the result may be a new variety, but there will be great vigor and they will transmit this to their descendants. They often also produce an unusually large number of seeds.

Plants which have already begun to vary will intercross one with another by aid of insects or by means of the wind, thus producing a still greater variety; but when these intercrosses have become very frequent their continuation tends to produce uniformity of the species. Pistillate flowers may be fertilized with their own pollen, or by the pollen from other flowers of the same stalk, or by pollen from flowers growing on other plants. The resulting seedlings will be unlike—those from the seeds of flowers fertilized by their own pollen being the least desirable and those from the crossed offspring of distinct plants showing the most points of advantage. Experiments have shown that they will exceed the self-fertilized plants not only in height, number of flower stems, weight of plant body, and in fertility, but they will also exceed in hardiness and luxuriance. In experiments conducted on this point, crossed plants withstood the injurious effects of being suddenly removed into the open air. They also showed an innate power to withstand unfavorable conditions, such as cold and intemperate weather, better than self-fertilized plants.

There is another point which I wish to mention. Sometimes we are desirous of retaining a certain admirable variation which, as yet, has not been fixed. In order to do this, we should remember that the more uniform the plant in all its parts, the greater is the likelihood that it will transmit its characteristics. Suppose it is desired to increase the size of the flower in a given plant. Two plants are bearing flowers: one has all large blossoms; the other has many inferior ones, but one abnormally large. The seeds from the plant bearing uniformly large flowers will more nearly give the desired result than seeds from the one large flower on the other plant.

Again, the advantages to be gained by crossing may be made more apparent by a careful selection. The sowing of large and heavy seeds usually yields better results than the sowing of unselected and small seeds from the same plant. Farmers sometimes save the wheat of inferior size of berry for seed wheat, or small, inferior potatoes for seed potatoes, resulting in a deterioration of future crops. With edible seeds, such as peas and beans, seeds of large size should be selected, to increase the quantity of the product, and the size may be intensified by high tillage.

We must be careful, however, to not expect too much from crossing. So eminent an author as Darwin has said: "It is a mistaken idea that the improvement of our fruits and seeds have been brought about by crossing. By crossing we obtain a combination of qualities found in two distinct breeds, and we also cross to increase the constitutional vigor. Purity of breed, with repeated selection of the best varieties of that breed, is the foundation of all improvement in our domestic plants."

It is difficult to get valuable varieties through seedlings alone. They vary too greatly from the desired type and the task of fixation is a difficult one. Seeds,

moreover, are more likely to perpetuate the characteristics of the plant than of the fruit. Therefore when the desired variety has been obtained, we shall get better results if we propagate from runners, buds, or grafts.

We should be careful in our selection of buds, however. We cannot expect that the qualities developed by a single abnormal bud on a plant or tree will be perpetuated in its offspring; but if a whole limb is characterized by a uniformity in its buds, all of which differ from those on the other parts of the tree or plant, we have reason to expect that these peculiarities may be transmitted to their offspring.

It is usually found that buds recurring at regular and definite intervals will be more potent than others in transmitting their characteristics. The Kansas black raspberry illustrates this. Originally a seedling, it has always been propagated by using plants obtained from about the seventy-fifth or terminal bud. However, while it gave great promise at first, it has seemed, after a trial of about ten years, to be retrograding. This is but a seeming proof of the view held by Prof. Asa Gray and by Andrew Knight, who maintained that fruits which have long been propagated by grafts or buds always become weakly. This is only another evidence in favor of rejuvenating our plants by crossing.

Plants propagated from roots give greater stability than those propagated by buds. The Turner red raspberry is one of these, and has shown no variation in a century. Mr. Kenoyer, in propagating his blackberry, uses root cuttings and sucker plants, to which may be ascribed much of the excellence of his plants. The Kittatinny, Snyder and Lawton blackberries are also propagated from the root and show no variation.

With regard to the variation of whole varieties of fruits, however, geographical changes have much to do. The Rhode Island Greening, for instance, so great a favorite in the East, becomes practically worthless when introduced in the West and South. The Jonathan and Bellflower are winter apples in Illinois, but become fall apples when naturalized in Kansas.

These changes are easily accounted for when we understand that habits are hereditary with plants, as in the period of flowering, in time of sleep, in the amount of rain requisite for seeds to germinate, etc., and any change in the environment of the plant sufficient to produce a disturbance in these habits may cause a variation in the plant.

There are a few rules of general import governing this whole matter of seed and bud variation that should not be overlooked. Giant forms result from the fertility of the soil, employment of newly harvested seeds, and crossing. Hardy varieties may be produced by successive selections from the most hardy individuals; hardy races, obtained by crossing with hardy species; coloration, from the influence of the composition of the soil, continued cultivation, repeated sowings, and careful selection. The color of the fruit, then, may vary because of the nature of the food, and the thickness of the skin may vary because of climatic changes. The size of the fruit may vary from the amount of food supply. The less marked the departure from the genus of the normal type, the greater is the likelihood that it will be perpetuated.

In conclusion, I would say that it seems easy enough to get varieties, but it is not varieties alone that we are after. We do not have time to speculate with too many varieties. The practical horticulturist must study existing conditions and be able to interpret future demands. He must have his ideal of fruit and plant in mind and then work slowly and patiently for the realization of that ideal. Too many of our fruit-raisers are men who carry on the business as a secondary consideration, and who understand nothing of the principles that control

the production of a fine article, and who blame the nurserymen because their fruit-trees do not bear well and the fruit deteriorates year after year. Nothing comes by chance. A man may improve the product of his orchard steadily by proceeding upon a practical, scientific basis. Many are seeking to produce new varieties, and many are hoping that some wonderful variety may "accidentally" develop for them; but what our markets need most is not so many new varieties but a careful maintenance of those which already exist at their highest standard of perfection, and that the horticulturists should study the adaptability of these to their proper soils, climates, and commercial uses. To be able to do this we must understand the causes of plant and fruit variation, study the effect, and determine how to so control the variation as to profit by it.

### COMMERCIAL GARDENING.

By O. F. WHITNEY, of Shorey.

Ever since man was ejected from the Garden of Eden, the human family has had a longing desire for horticultural products. We can still see the primitive gardens of our near ancestors located near the house, on the warmest piece of land available, fenced with palings split from native wood, and presided over mostly by womenfolk; where no horse ever pulled a cultivator through the fertile soil; where a wheel-hoe or other labor-saving implement was unknown. Here, in this little, fertile patch, the desire for something more than bread and meat was first planted; and as time wrought its many changes and man congregated and built cities, the remembrance of fresh, crisp and luscious fruits and vegetables carried man back to his childhood days, and the desire for these fruits and vegetables created a demand, and this demand created the commercial garden of to-day; which in the last twenty years has made a gigantic growth, having a capital invested of near 200 million dollars, and employing 300,000 men, and furnishing healthful and light labor for 40,000 women and children, using about 600,000 acres of land. This industry employs all kinds and classes of labor, from the man who only knows enough to handle a hoe to the latest output of our agricultural colleges, and from the small boy who can just tell the difference between a cultivated plant and a useless weed to the skilful manager of a greenhouse.

For a successful commercial garden a number of essentials are required. Nearly any man with fair intelligence, sufficient industry and some experience can succeed to an honest living. Access to market is of vital importance; after producing you must reach the consumer at the least possible expense and in the shortest time. For this you must locate close to your market or else at a good shipping point; and a good shipping point is a railroad center, so that you may be able to take advantage of various markets; local causes sometimes producing a good demand in one direction and sometimes in another.

From Texas, with her early spring, clear to northern Michigan, step by step, as one day and then another advances spring on her journey to summer, so all the way are gardens planted to supply good, wholesome food for mankind; we in this locality frequently shipping our produce south to supply that market with vegetables when the crop is short or exhausted down there.

In shipping to a distant market the producer takes many risks. There is loss in transit; sometimes your produce arrives on an overcrowded market and your goods are sold for less than cost; you are sometimes presented with a back draft to cover freight and other expenses; and we have heard it intimated that the commission man had not always acted exactly square. In spite of all these

risks, and the devastation by insects and fungous growths, an immense amount of fresh produce is shipped to distant markets and remunerative prices received.

The home market is preferable in some respects; you come in personal contact with your customers—an important fact; you are on the market from day to day and know when to rush your produce and when to hold; and you furnish your own conveyance in transportation to market—a big item on a year's business. Frequently large cities are so oversupplied that great quantities are thrown away and are a dead loss to all excepting the railroad company.

The closer you can get to the center of your market the better. The shorter the haul the more profit for the gardener. Three miles further out than a competitor will make you travel 1200 miles further each year than he does; will cause the loss of an entire working month, and works against you the same way when hauling back fertilizers. If garden land joining the limits of a city is worth \$300 per acre, land five miles out is not worth more than \$50 per acre to the market-gardener. When you are close in you have the advantage of procuring extra help; and when this help is needed you must have it or suffer great loss to your crops. Very fortunate it is that vacation comes at the time when the boy is most needed, and it is good for the boy as well as the garden. A boy, or better, several boys, properly directed by some competent person, will destroy as many small weeds as a man, and at less than half the cost. Then it teaches the boy habits of industry, keeps his mind directed in proper channels, and, better than all, brings him in contact with Mother Nature. This is also the time when you need berry-pickers; and girls and young women are the ones for this kind of work. They exercise more care, are lighter of touch, and in many ways are preferable to boys in picking fruit.

In selecting the land for your garden, you must have a good, sandy loam, ranging from a light to a medium heavy soil. It must be mealy to the touch—no sticky soil in this business—slightly sloping to the south, where it can receive the full benefit of the sun's warmth in early spring. Nearly any land will grow vegetables, but the best vegetables grow on the very best of land; and to make this bring a profitable crop, you must fertilize it to a perfect state of production.

Fertilizers are of three kinds: The commercial fertilizer, which is not used to any great extent yet in the West—not so much, perhaps, as it should be. Then the green crops which are plowed under. These should consist mostly of legumes, they furnishing more nitrogen than other green crops. Where large tracts are to be fertilized, this method is probably the cheapest of any, especially if one must haul the other fertilizers any distance. Lastly, we come to the original of all fertilizers, the standby of ages past and gone—the barn-yard fertilizer; and to get this in quantities of any value you must be near a city, and the closer in the better. With this fertilizer we get great quantities of humus, the most important element of our soil; without it our soil bakes, packs, and becomes something like an unbaked brick. With plenty of humus in the soil we need not fear the drought so much, and we can cultivate land one or two days earlier after a rain if it is well supplied with humus. You may have good land, but not so good but what fertilizers will make it better and more productive. All crops respond readily to a liberal application of plant-food. Be liberal in this matter, and the increase of the crop will repay you an hundredfold.

Water is one of the necessities of this business—as necessary to successful gardening as milk is to cheese. Even though you do not intend to irrigate the growing crop, the hotbeds must have water, and plenty of it, from start to finish; and in preparing vegetables for market great quantities of water are used, and for this purpose a storage tank is needed, into which the water is pumped by a



windmill or other power, or a force-pump is so arranged that it can be worked by some power other than man's. We believe in irrigation, and in selecting a place one should do so with the idea of irrigating at some time in the future; for it is only a question of a short time until we will irrigate to a much greater extent than we do now; and it seems likely that the day is not far distant when all the visible water of our Kansas streams will be used for the benefit of growing crops.

The plowing should always be done in the fall, which lessens the work in spring, when we can always find plenty to do; and if we have a late spring, it is very convenient to have the land about ready for seed as soon as the frost is out; besides, the year's work will be more evenly distributed on the horses. With deep plowing in the fall a larger reservoir is made to retain the moisture that falls during the winter. Do this plowing as late as can be done before the ground freezes up for the winter; then, if it freezes before any rain has fallen to pack it, your land will be in excellent condition in the spring, requiring only a little harrowing and smoothing to be in a perfect condition for the garden seed. The action of the frost on freshly plowed land is very complete, thoroughly pulverizing it and unlocking the plant-food.

In planting the seed to produce your crops do not be stingy, for as you deal with nature so in turn you will be dealt by. You must not expect a full crop when you have planted only half enough seed. Seed, as compared to the crop which it produces, is a small item of expense. Order your seed from a reliable seedman. Do not buy where it is sold on commission by grocers, hardware merchants, and the like. Poor seed, or that which is not true to name, is an expensive luxury which any gardener is too poor to indulge in. Great care must be used in planting this seed; it must not be too deep, for the germ has a limit to the distance it can grow underground. The smaller the seed the nearer it must be to the surface. It is all-important that the ground should be well pulverized and firmly pressed around the seed, and as soon as the rows or hills can be seen the cultivation should begin. Of course we destroy weeds while we cultivate, but to destroy the weeds is only a secondary consideration; with proper cultivation no weeds are allowed to start. We cultivate to stir the land, so that air may penetrate the soil and help feed the plant, and also to form a dust mulch, to keep the land from baking and conserve the moisture which comes to the surface by capillary attraction.

Cultivation, intense cultivation, must be your watchword. It means size; it means succulence; it means everything to your crops. Irrigation is all right in its way; all of us cannot irrigate, but all of us can and must cultivate. We saw a field of corn this year that went twenty bushels to the acre, and from the time it was planted, for a period of ninety days, this field only received one inch of rain. Cultivation made, in this case, twenty bushels of corn to the acre, and if cultivation could produce a crop like this in a summer such as 1901 gave us, then by cultivation we can always produce a crop.

For detailed information on all subjects pertaining to your business, get any good handbook on the subject, keep in touch with your experiment station, take standard periodicals, and use all the labor-saving implements that can be used to advantage. The best is none too good for your business, and you must be up to date yourself. It is the man in front of the van who achieves success.

Crops must be rotated. If the same kind of crop is grown continuously on the same piece of ground all the insects which prey on that species of plant are bred, and many hibernate there and are ready early in the season to attack and destroy. This applies as well to the fungous growths of all vegetation. Rotation

is very important, and will pay well if worked out in detail. Tubers, roots and bulbs should never follow each other; cabbage should not follow lettuce, and so on. Always try to follow each crop by that of opposite character.

You cannot afford to let such valuable and highly fertilized land lie idle for a single day during the growing season. To keep this land producing crops up to its full capacity, there must be the very earliest crop that can be profitably grown, followed by some early summer crop, and this by fall and late fall crops. Some early spring crops succeed fully as well in the late fall, and the demand is frequently good. You can plant a second crop on the ground from which you are harvesting a crop without detriment to either. Tomatoes can be planted in the radish or early beet patch. It is not uncommon to get three crops from the same piece of land in one season. For instance, plant peas; when they are grown plant corn; cut up the corn and sow turnips; and you are quite safe to try this and many other combinations.

Land under this treatment will be constantly cultivated; no chance for a crop of weeds to sow their crop of seeds broadcast over it. High-priced land must be worked to its full capacity to pay rent, interest, taxes and labor and a fair profit.

In preparing your products for sale you must meet the demands of your market. The vegetables must be fresh, clean, and of uniform size. Do not bunch small and large ones together. Your crop will bring nearly as much if you do not sell the small ones. Uniformity in size is a great help in selling. Arrangements that are pleasing to the eye will help dispose of your load. Have the quality as good all the way through as on the top; this assures your customers that they may depend on what they get from you. If you are a shipper, put your name on every box or package, and see to it that you send nothing to market but what you would willingly partake of yourself.

Up to this period you have been a laborer, producing the very best the fertile soil and good management can grow, but now you are a merchant and must be alert, wide-awake, and right up to business; for here you meet strong and active competition and many tricks of the trade. Much of your produce is perishable, and you must sell and so must your competitor, and where there is a surplus on the market very low prices are often quoted; but if you have produced a first-class article you are justified in asking a little more than the other fellow does; and if you really have the best on the market you are all right; and if you have not the best it is better to haul your load home than to pull the price down to a ruinous rate, because you hurt the market for the load you must bring to-morrow.

The public must be supplied with the products of the orchard and garden, and every year the demand is increasing, because the people realize that fruits and vegetables are essential to health; and when they partake of this food—fresh, canned, or dried—they know they are not partaking of any embalmed food. And you—well, you will have the satisfaction of knowing that you have done your duty; have helped your fellow man on his way to a higher civilization. You are not on the rapid road to wealth, but what others have done you may do. We know of one man this year who cleared \$100 per acre on potatoes; another who did as well on fruit; and what was formerly a muck swamp, near Canisteo, N. Y., brought the owner \$700 per acre in onions. Not quite all of us can do this well the first year; but remember that 1000 horses are raised before a world-renowned trotter is produced, and that many thousand tunnels and prospects are started before a "bonanza" gold-mine is found; but he who plants, cultivates, gathers and supplies his fellow man will find contentment, reap happiness, and enjoy a healthy old age.

## REPORT ON SMALL FRUITS.

By G. M. HOLSINGER, of Rosedale.

The drought of last summer was so severe that experiments and general observations based upon the year's crop would be misleading if one did not rely, to a certain extent, on the results of former years, and take into consideration the fact that last summer was abnormal, and one the equal of which may not reasonably be expected for years to come. We had no beneficial rains in our section of the country from the 10th of April until about the middle of August; so that during the flowering and fruiting season we were without our usual moisture, and results based upon conditions of the kind would only be conclusive as to what would do well in the Sahara, or the short-grass section of "bleeding" Kansas. However, the season opened with remarkably brilliant prospects, and my imaginary bank account for the coming August was larger than my actual account ever was for a corresponding period. Raspberries that had never before borne a full crop had made a splendid growth, were free from anthracnose, and were apparently in ideal condition. Blackberry buds were alive, and there were plenty of them; strawberries were peeping through the mulch, showing perfect rows of green such as I never had before. But alas and alack! there was "many a slipper 'twixt the cable and the gripper," and before the season was over my bank account was large, but large the wrong way.

In addition to the Kansas raspberries before mentioned, we had a nice little patch of very promising two-years-planted Cumberland, and a few Gregg; all healthy and in nice, thrifty, growing condition. But on May 25, when the raspberries and blackberries were in bloom, we had a severe frost—severe at least for that time of year. We did not notice the results of the frost for a day or two, when, upon close inspection, we discovered that about three-fourths of the raspberries and blackberries were killed outright, all which had bloomed before the frost being dead. The others might just as well have succumbed, for the drought kept them from developing, and it would have saved me lots of worry as to when it would rain. We had a few raspberries—perhaps ten per cent. of a crop—that were marketable; as before stated, conclusions from such results would be misleading. However I am satisfied that the Kansas is the best-paying berry we have at present. It is a good producer and it certainly is a good seller. Gregg is still in favor and I would not be without it. It has some faults not noticed in the Kansas. Cumberland promises to excel the Kansas; this, though, is only a promise, for it has not been thoroughly tested here yet, and we are unable to say positively as to what it will do. I had such confidence in it that I planted three acres last spring. Cardinal is certainly a splendid grower. The largest raspberry canes I ever saw were from the Cardinal. From others I learn that it is very productive, but that its color will interfere with it as a commercial variety. It is especially recommended for the home garden. I would not plant Hopkins; it requires too much work to get them picked and they won't sell on this market alongside of Kansas. Cuthbert does well for a red raspberry, doing especially well on new ground. It will pay you to plant Cuthbert.

Blackberries were nearly a total failure; we had a few Early Harvest, which proves to my mind that of which I was before convinced, viz., that it is a money-maker. Ripening as it does early in the season, it is picked and marketed before the later varieties come on. It has, too, the good quality of having small seeds, thus making a splendid canning variety. I believe that in the last four years it has made more money, acre for acre, than any other variety marketed in Kansas City. In spite of the fact that the drought was so severe, there were some

splendid Loudon grown. The parties who grew them claimed that they withstood the drought better than any other blackberry and ripened well-developed fruit throughout the entire season. Mr. Kenoyer kindly sent us a few of his new blackberry, but we were unable to form any conclusions as to its merit. We are still planting Snyders.

Currants are unsatisfactory with us. We have raised a few good crops, but other small fruits pay us so much better that we have quit growing them. Red Dutch and White Grape seem to have made the most money for us; Cherry is a shy bearer but very handsome, and a good seller when successfully grown.

Gooseberries are not selling as they did in former years. They were slow sale this year, although the supply was limited; but for all that they seem to be profitable and many people are planting extensively, especially to Houghton, which is our favorite.

Strawberries suffered this year, but not to the extent that other later fruits did. They were injured very little by the frost—a fact that was highly pleasing to me as well as exciting considerable surprise. I have always been fearful that a late frost after strawberries had blossomed would injure if not entirely ruin our crop for that year. Our strawberry field is located in a low bottom, about eight or ten feet above the creek bed, and about twenty or thirty feet below the general level of the raspberries and blackberries before mentioned, which were so badly injured by the frost. When the frost came I supposed that the strawberries would be killed, but to my surprise and gratification I found that only those berries yet out in blossom were killed. The berries from which the petals had fallen were uninjured, and those in bloom were so few in number as to render the injury unnoticeable, although we had three or four frosts, severe for that time of year—severe enough to kill the fruit on blackberries and raspberries twenty or thirty feet above. Other patches in our vicinity were more severely injured by the drought than was ours. Being located in the bottom, we had plenty of water for irrigation, and when it became evident that the long-overdue rains would not materialize, we bought an engine and pump and set to work night and day to run water on the field; by so doing we were able to save the fruit on about one-half of the field, which not only paid for the engine and all expenses incident thereto, but also made a snug little profit. If we could have foreseen the drought and gone to work a week earlier, we could have saved the entire crop.

And here I wish to give it as my opinion that it is necessary that strawberries should have a great amount of water during the ripening season. In the summer of 1900 we had a patch of Parker Earle through which ran a ditch about a foot below the general level of the patch, and as 1900 was an ordinarily damp season, during strawberry time this ditch was always partly full of water. I imagined that the berries which grew in this miniature swamp would not ripen; but, to my surprise, the finest berries in the whole patch grew in this ditch, which was so wet that one could not go across it without going shoe-top deep in water. Again, when we laid our pipe for irrigation this summer, we were rushed and had no time to watch leaky joints, and as a result parts of the field were flooded continually; although it was very wet—so wet as to be slushy at those places—yet these wet patches produced splendid berries; and so, as a result of my experience, I concluded that the old bugbear of failure of strawberries in low ground is about played out, and I conclude that the bottom is the logical home of this favorite fruit, for the reason that one can get water when he needs it for irrigation, aside from the fact that the bottom is the last place to need it.

As to the favorite varieties of strawberries, we have several. We can't do without Parker Earle; about half of our planting is of this variety. It is not so

good when grown on upland. It grows too long and does n't develop as it does in the bottom. Warfield is well enough known to need no recommendation. Wm. Belt is a splendid home variety, and does well commercially. It is large, handsome, prolific, and decidedly pleasant to the taste; it is a good table variety. Windsor Chief commands about twenty-five cents per crate more than other berries of like size and color because of its fine table qualities. Clyde does better for us as a two-year-old than as a yearling. Bubach, Marshall, Stayman, Eclipse, Glen Mary and Haverland have not done well for us. Bubach does better on upland. Excelsior is a new berry, and is the earliest I know anything about. It will pay you to plant it; it is very early, very prolific, and of good color; there is money in it. Nick Ohmer, another new variety, is too good to leave out; it is large, sweet, has a wonderful aroma, is very prolific, and in my opinion a remarkable berry. By all means try Excelsior and Nick Ohmer. Gandy is the latest of all, and prolongs the season until berries arrive from Colorado, and when strawberries, much as we like them, should give way to other fruits.

As to the care of strawberries, I think it is as necessary to mulch as to plow and hoe; a good, heavy mulch, about four times the amount that is taken for a given area of what will keep the berries clean, will keep the ground free from weeds during fruiting, and will also conserve the moisture.

I would not close this report without an exhortation to more systematic, persistent and thorough cultivation; you cannot expect good, profitable results unless your ground is free from weeds and your soil is kept loose. If you are in doubt as to the result, try a single acre, and put double the usual work thereon, and see how it will pan out. The prospect for a crop next year is as good as could reasonably be expected after the severe drought. Raspberries and blackberries made a good growth late in the season and promise well. Strawberries made few plants and look ragged; still I expect a half crop next year.

### REPORT ON SMALL FRUITS.

By B. F. SMITH, of Lawrence.

The small-fruit season of the year 1901 was the driest known for many years, or at least since berry fruits became a commercial product. On the highlands around Lawrence there was not enough rain to lay the dust from the 18th of April till the 27th day of July. Many of the forty-seven varieties we are testing and growing for market wilted under the trying ordeal. Among the varieties that were the greatest sufferers were the Warfield, Windsor Chief, Splendid, Clyde, Miner, Parker Earle, Lovett, Glendale, Brandywine, Kansas, Star, Patrick, Paris King, and some others. Varieties that resisted the drought best were Bederwood, Excelsior, Johnson's Early, Sample, Bisel, Captain Jack, Crescent, New York, Vorhies, Margaret, Ridgeway, and No. 77 (a new variety of my own production, under test). About four-fifths of our crop of raspberries dried up on the bushes. Early Harvest blackberries turned out about four pickings. All other varieties dried on the bushes.

In comparing the labor bestowed on the soil between other berry fruits from planting to fruitage, the gooseberry has been my most profitable crop. Notwithstanding the severity of the drought, its berries were of good size from the first to the last picking.

The best currants are the Fay and Red Dutch varieties; other varieties on my soil are shy bearers; most of my currant bushes were planted six or seven years ago and this is the first season that they have borne any crop worthy of mention. The currant has more insect enemies than any other small fruit; but

this year the drought and excessive heat kept the currant-feeder (?) in the shade; hence I was able to market some currants at \$2 and \$2.50 per crate; but in this there was not a cent of profit, considering the labor bestowed on them. Owing to the uncertainties of the fruitage of currants, I cannot recommend their culture anywhere in Kansas as a profitable branch of commercial berry-growing; but it may pay the farmer or the mechanic with a village plot to grow a few dozen currant bushes.

Now I cannot refrain from giving our fruit-grower friends some experience in subsoiling the land for strawberries. The American people are the greatest inventors and experimenters in the world. We are not content with doing well; but are continually seeking fresh fields of adventure and experience on a higher plane. So we fruit-growers, too, are on the alert and experimenting for greater production and larger fruits, with as little labor as possible to bring the desired result. So I sought and found a lower stratum of soil with a subsoil plow, with the idea that I would produce a greater crop of berries by subsoiling the ground fifteen to eighteen inches deep, in order to hold the moisture in times of drought. This year I had three new one-year-old strawberry fields on land that I had subsoiled the fall previous to planting. The plants had had double the ordinary attention, with the latest improvements in cultivation, hoeing, and plowing. These three fields that had been nursed so carefully, and that promised so well, did not yield enough berries to pay for the straw mulching put on last autumn to protect them during the winter. On examination, I found that the subsoiled berry patches were dry to the bottom of the loosened subsoil; the soil had not held the moisture, as I was assured it would. On the land plowed to the ordinary depth of four or five inches is where I gathered my 1901 crop of strawberries. I would not permit a man to do any subsoiling on my fruit farm for twenty dollars per acre. This experiment cost me over \$1000. While it is not as pleasant to tell the world about our failures as it is of our successes, I give this one for the benefit of my friends.

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### SMALL FRUITS.

By F. W. DIXON, of Holton.

The first and best is the strawberry. We think we are safe in saying that never did we see such fine prospects for an immense crop of very large berries as we did at the beginning of the ripening period, about May 26. The spring had been ideal; the heavy early spring rains had saturated the soil. Then, during the blooming period, there was neither rain nor frost to prevent pollination or perfect setting of perfect fruit; the drought continuing, of course, could have but one end. Drought alone was bad enough, but when the thermometer ranged from 90 to 100 degrees in the shade, the end came only the faster. Most of our fields, being well mulched, did not give up the fight without producing a fair crop. This season proves that soil, and varieties suited to it, have much to do with successful resistance of drought. Some sorts were entirely ruined, while other rows, only three and one-half feet from them, produced a good crop of good berries. Location is also important, the north slopes producing much larger crops of berries than the south slopes; the southwest, of course, bringing the poorest results, with the northeast slopes doing the best.

We think the Excelsior was the best-paying berry with us this season. It was mostly picked before the extreme hot weather began, and, of course, the soil was not yet very dry. This was a fine-looking berry, but of poor flavor, firm enough to ship anywhere. Earliest and Early Success were much better than

Michel's Early. After Excelsior, for profit, the race was close between Clyde, Bubach, Warfield, Mele, Haverland, Crescent, Phillips's Seedling, Bederwood, Windsor Chief, Splendid, Bisel, and Staples, the odds being in favor of the earlier berries. Of the late berries, we think none were profitable. Aroma proved the best, but Gandy was a close second. Our other late varieties were not so favorably located.

We ought to have a report of some of the newer sorts, but it seems that all of them were in an unfavorable location. My berries are on a ridge and exposed to the hot sun and wind, and of course were greatly injured; and we believe now were on the poorest land on the farm to resist drought; at any rate, we got very little fruit from any of the new sorts; probably the August Luther did the best, but it was an early berry. To sum all up, we had about one-half of an average crop, but not one-fourth of what our field promised. Prices of berries were very good, and notwithstanding the extreme weather there was some profit.

As we passed from strawberries to raspberries the days became hotter and longer; every day, as you all know, was a record-breaker; but the raspberry field we could cultivate, and to some extent could prevent the soil drying out entirely. Kansas proved the best of the black caps. The new Cardinal promised a wonderful crop, but the long-continued heat and drought proved too much, and we only picked a light yield; the Haymaker proved to be a good berry, of Cardinal type. Every day the weather became a little hotter; if we should say warmer, the word would be inadequate. That kind of weather ushered in the blackberry season; of course we had kept the cultivators going; the soil was moist, but the heat was extreme. Other blackberry growers in our section had no fruit, but we had enough to pay a small profit. Snyder was our principal variety, but the berries were small and seedy; on some soil they dried up entirely. Early Harvest proved the best and most profitable; most of these sold for \$2.50 per case; the yield was about one-third of a full crop; so far the Early Harvest has proven the most profitable for us. We fruited some new varieties in a small way, but not enough to say just how they would do in field culture.

#### REPORT OF COMMITTEE ON EXHIBITS.

- Wm. H. Underwood, Hutchinson, three plates of Missouri Pippin apples.
- W. F. Scrimsher, Silver Lake, three varieties of apples.
- A. H. Buckman, Shawnee county, two plates of Gano apples.
- E. O. Farrar, Abilene, one plate of seedling apples named Buck's Golden.
- Aug. Pearson, Assaria, Saline county, three plates of seedling apples.
- H. C. Carter, Baldwin, one plate of seedling apples.
- Peter Heil, Shawnee county, one plate of Arkansas Black apples.
- J. B. Fergus, Allen county, nineteen varieties of apples.
- John Brazilton & Sons, Wathena, seven varieties of apples.
- Geo. Gunning, Wathena, one variety (two plates) of apples.
- Wm. Cutter, Geary county, ten varieties of apples.
- W. B. Eames, Delphos, four varieties of apples.
- E. J. Whitaker, nine varieties of apples from cold storage.
- Doctor Bohrer, Rice county, two varieties of apples.
- A. Oberndorf, jr., Centralia, three varieties of apples.
- Thomas Stevens, Jefferson county, one plate of apples.
- Missouri State Horticultural Society, thirty-two varieties of apples, two varieties of pears, four varieties of crabs.
- Two plates of so-called Black Ben Davis, exhibited by Stark Bros., of Mis-

souri, received our most careful attention, on account of doubt as to its being different from Gano. We found it to be more solid, coarser grained and juicier than the Gano; all of which may have been caused by special culture or after-treatment. There is so much dispute over this apple, and it is so decidedly condemned by W. G. Gano, Wild Bros., and others, who have taken great pains to investigate, that it is of more than ordinary interest to tree-planters.

Miss Rubart, Junction City, collection of artificial fruits, very interesting.

Payne's Long Keeper (from Missouri) is an apple of fine promise, of good size, color, and flavor.

H. C. Carter's seedling apple was large and red, but of inferior quality.

Several seedlings were shown, but were either too small or out of season; we cannot speak of their real merits. It is our verdict that the western part of the state is fast coming to the front as an apple-producing section, as the very best specimens are from there, from a section until recently considered a poor apple region.

WM. CUTTER,  
B. F. PANCOAST,  
F. HOLSINGER,  
*Committee on Exhibits.*

## REPORT OF THE ENTOMOLOGIST.

By E. A. POPENOE, of the State Agricultural College, Manhattan.

### THE CODLING-MOTH.

Though this subject has been presented so often before this Society as almost to merit the action proposed by members in regard to pear blight, that it be barred from future meetings, it is evident to the writer hereof that there yet remains opportunity for missionary work in the direction of inducing a wider popular knowledge of the codling-moth and its ways and the approved methods of its destruction. This effort must no doubt continue to be put forth for years to come. It is only by continued iteration that we may hope to overcome the popular objection to the warfare upon this insect; and, in my opinion, it is the duty, though it be a somewhat tiresome one, of the State Horticultural Society, as the exponent of advanced horticultural information, to keep the matter before the people.

The history of the apple crop for 1901 is practically a repetition of that of previous years: a fair product in quantity, reduced in marketable value by the work of this insect; the total loss no doubt greatly in excess of the expense of treating all the bearing trees in the state in a thorough and successful manner.

Judging by reports and letters of inquiry that yearly come to my table, I am satisfied that it is still necessary to present matters of the nature of fundamental information upon the habits of this insect and the methods of its subjugation, and to correct various popular delusions as to the efficacy of the spraying engine where properly used. Some correspondents report success with the treatment, others failure, and others yet inquire if there is "any means of protecting the apple crop against this apple-worm." Some of the members of this Society would as soon be without a cultivator as without a sprayer, and others still need to be brought to the light as to the proper application of this useful and valuable instrument. The consensus of expert opinion is with the former, and the doubters must remain in the constantly decreasing minority.

Too many of the small orchardists of our state are possessed of a half knowledge that is sometimes less safe than absolute ignorance. They "spray" without being certain as to substances, mixtures, times, and methods. They expect



a single year's work to exterminate the insect, regardless of their neighbors' carelessness, and the result is consequently disappointing to them, turning them into opponents of all treatment. It is true that there exist well-digested and luminous text-books concerning this line of work, and numerous publications by the different experiment stations and by the United States department of agriculture, to be had for the asking; but these evidently are not available to all, or are entirely overlooked. It is for the benefit of those yet unsatisfied upon these points that the following résumé is presented, and in its preparation I have made free use of all sources of reliable information.

#### LIFE-HISTORY IN BRIEF.

The codling-moth belongs to a family of true moths, the most of which in their larval state feed upon leaves of various plants, many of them being injurious as leaf-rollers, the fruit-eaters, however, being very few, and practically no others than the present species being troublesome. It is one of the earlier orchard insects to receive notice in garden literature, and has had its due share of attention ever since the first account of it. According to Professor Slingerland's historical account, in Cornell Bulletin No. 142, among earlier suggested destructive measures were the scraping of the trunks of the trees, to remove rough bark, and the application of an alkaline wash; the banding of the trunk or the placing of cloths in the forks of the branches, to capture the worms; the spraying of the tree with whitewash, to fill the calyx cup and so prevent egg-laying at that point; \* various traps, including lights in the orchard; † and finally, in 1878-'80, the use of arsenical sprays. Since the latter date the efficiency of the arsenical spray has been the subject of repeated experiment in various quarters, and I think I may say without contradiction that, in every case where proper conditions have been observed, the advantage of this treatment has been fully proven.

The moths appear in spring, having passed the winter as larvæ in cocoons spun the previous autumn in any convenient hiding-place, as the crevices in apple bins, boxes, or barrels, and out-of-doors under the scales of rough bark on apple trees and in old birds' nests. The time of the general appearance of the moth corresponds fairly with the period of the fall of the bloom of the apple tree, though under different circumstances, as special warmth or the reverse, specimens may appear slightly earlier or later. After a few days eggs are deposited on the young apple or on leaves near by. These hatch in a week or thereabout, the young worms making their way into the young apple mostly at the eye or blossom end, where they feed sometimes a few days before penetrating toward the core. Upon becoming full grown they work their way outward, and whether the attacked apple remains on the tree or falls to the ground, most of the worms abandon it and curiously make their way to the trunk, where they spin their cocoons, if shelter be afforded by scales of bark or by bands of cloth, paper or hay placed there for the purpose. The fact that many of the worms emerging from fallen apples find their way to the trunk to pupate is shown where three bands are placed upon the tree, when many cocoons will be found under both upper and lower bands, and but few under the middle one. The pupal state is assumed in the cocoons, and after about ten days, more or less, the moth appears. In the summer the worms transform at once after spinning the cocoon, but the worms that come out of the apple in the autumn remain in the larval state until within two or three weeks of the appearance of the apple bloom before transforming to

\* This treatment was suggested by an experiment in which the calyx cup was covered with wax, and all fruit so treated found free from attack.

† Still offered for sale, and recommended by those financially interested, but actually worse than useless to the orchardist.

pupæ. Occasionally a cocoon will be found in the basin of the apple next the stem. Numbers will be found in any bird's nest on the branches, many in the corrugations of the bark in the fork of the tree, and in any shelter on the ground under the branches, such as piles of boards or the like.

The moths emerging from the pupæ of the summer brood soon mate, and the females lay eggs as before, the second brood of worms occupying the now well-grown apples. Our investigations at the experiment station have shown us that, although, through the irregularity in appearance of the moths in spring, and apparently through the irregularity in time of full growth, there is no time during summer when worms may not be found in some of the apples, yet, through their appearance in greater numbers under the bands at certain times, it is evident that there are two and possibly three broods annually in our latitude, and this is probably true for the entire state. As before stated, the worms of the last brood pass the winter in the larval form, in cocoons, in any convenient place of shelter, and especially in crevices in bins, cracks in barrels, and corners in the apple room, where they have gone in the infested apple.

This, briefly, is the life-history of the codling-moth, and upon these facts is based the established treatment. In respect to the value of this treatment I am not so sanguine as those who state that after spraying not a single wormy apple can be found, where on adjoining trees not sprayed ninety per cent. of the apples are wormy. But annual trial for twelve years has convinced me of the truth of the deductions from our first extended trial at the Kansas Experiment Station, namely, that under proper treatment the average difference in marketable fruit, in favor of the orchardist, amounts to a possible gain of fifty per cent. of the entire crop, at an expense of application of a few cents per tree.

The treatment that we have pursued is as follows: Spray as soon as the petals have fallen (no delay admissible) with any good arsenical poison. Spray again at once, if the first application is followed by a good shower of rain, and, at any rate, give the trees a second spraying not later than ten days from the date of the first. This I recommend, because we have found, on similar trees, decidedly fewer wormy apples where a second spray had been applied. On the other hand, a third application does not seem to show a sufficient decrease in affected fruit.

As to materials, I have found nothing better in general than good Paris green, in the proportion of an ounce to ten gallons of water, with the lime water from an ounce or more of fresh quicklime added. London purple we have entirely discarded, as being too variable a poison, and because of the frequent serious scalding of the foliage resulting from its use. Recent trials show favorably for the use of arsenate of lead.

In addition to the application of the spray, place bands about the trunk or large branches as soon as the first worms are leaving the fruit, the rough bark having been previously removed by the use of the tree scraper. We prefer the band of carpet paper, eight inches wide at least, held to the tree by a broad-headed carpet-tack thrust by the thumb into the bark and through the overlapping ends of the band. Every eighth or tenth day the bands are examined, and the captured larvæ and pupæ killed by any convenient means, the bands replaced, and so till the crop is off the tree. The number of worms so destroyed has equaled, in various tests, from 8½ to 44 per cent. of the total of infested apples on the tree, a vast and profitable reduction in the number of insects that would otherwise affect the remaining fruits or the next crop.

As a third measure, see to it that no worms that go to the apple room with the mature fruit escape as gravid moths, to lay eggs in the orchard. Screens in

the windows will pay for themselves, not by keeping other insects out, but by keeping the moths in.

If every orchardist could be persuaded to adopt these defensive measures, there is not a shadow of doubt that many a load of apples that now goes to the cider-mill would go, rather, to the cold-storage house, with decided financial advantage to the grower.

#### THE GRAPE FIDIA, OR GRAPE-ROOT WORM.

From several sources I have received information and specimens that indicate that the grape fidia is occasionally the source of considerable injury to the vine in Kansas, and, although I have had little opportunity to observe in person the work of the insect, it seems desirable to bring together here an account of it, collected from available sources, for the benefit of our vineyardists.

The grape fidia is a beetle belonging to the family Chrysomelidæ, to which pertain also such well-known pests as the Colorado potato-beetle, the cucumber, beetle, and the corn-root worm. The adult insect is one-fourth of an inch long—rather narrow, with slender, reddish legs and antennæ, the head usually drawn rather closely into the front of the thorax. In color the beetle is reddish brown, covered thickly with a coat of gray, scale-like hairs, obscuring the body color; but in old specimens this hairy coating is often rubbed off. The beetles are not very active, drawing the legs and antennæ close to the body and rolling off the leaf to the ground, where their gray color makes them hard to see. They feed upon the upper surface of the grape leaf, gnawing out patches of the leaf substance, and when numerous, as I have sometimes seen them, riddling the leaves or eating them to tatters. Besides the cultivated grape, they attack also the wild vine, and the *Ampelopsis* or Virginia creeper. Professor Riley records the beetle from the redbud, and I have taken it upon various woodland shrubs, but without evidence that it fed on them. Specimens of my collecting determine the appearance of the beetle throughout the month of June, and probably also throughout the greater part of July, in Kansas.

According to Professor Webster, of the Ohio Experiment Station, who has made the only published study of its life-history, the beetle lays its eggs during the months stated, on the vine, above ground, under shreds of old bark, the young hatching in a short time, and the young larvæ dropping to the ground, which they enter through the crevices, especially near the base of the vine, until they reach the underground parts; here they feed at first upon the tender fibers, but afterward on the bark of the older roots, which they ultimately denude completely of their bark. They pupate in the ground, the most of them remaining as larvæ within their earthen cocoons until the following June, when they transform rapidly to the adult.

It has been shown conclusively that the adults are readily destroyed by the use of an arsenical spray applied at the time of their first appearance. For the safety of the leaves of the vine, which are usually easily injured by unmixed arsenic, an equal proportion of fresh lime should always be used in solution in the spray. In accordance with our experience with other insects, I suggest the application of Paris green in the Bordeaux mixture, which every well-informed grape grower now applies as a preventive of vine diseases. The proportion of this should be about one ounce of Paris green to ten or twelve gallons of the Bordeaux mixture.

C. L. Marlatt, assistant entomologist of the United States department of agriculture, suggests the use of kerosene emulsion applied about the base of the vine at the time of the hatching of the young, to destroy them as they make their way into the soil.

Mr. A. Oberndorf, jr., of Centralia, Kan., reports to me his use of carbon bisulphide injected into the soil about the base of the vine, as a means of destroying the larvæ after they have begun their work. It seems, however, that the earlier use of the poisoned spray on the leaves, by destroying the adults, would render these latter methods unnecessary. Thorough surface cultivation of the vines, by keeping the cracks of the ground closed, and by providing a dense layer of pulverized soil, is also serviceable as a means of checking the larvæ in their attempts to enter the earth.

This beetle should not be confused with the rose-chaffer or rose-bug, so called, for which it is often mistaken. In my experience, the genuine rose-chaffer is a much rarer insect in Kansas, though on apparently trustworthy evidence its occasional local abundance is reported, and we must reckon with it also as a destructive vine pest.

I shall be greatly obliged to any grape grower who will forward to me specimens of any beetles of this character found injuring vine leaves, in order to determine more fully the distribution of these defoliators.

THE GRAPE-VINE FLEA-BEETLE, OR STEEL-BLUE FLEA-BEETLE.

The beetle here named is another insect that, while local in its appearance and not uniformly prevalent, proves very destructive when it does appear. It also does its work so rapidly that the damage may be done before its presence is noted.

This insect is a beetle belonging to the same family as the preceding, but to a different subfamily, the insects of which are distinguished by thickened hind thighs, associated with a habit of jumping like fleas when disturbed. The adult grape flea-beetle measures a little above one-eighth inch in length, is of an oval form, and in color is a polished steel-blue or purple color. It is the only beetle of this character attacking the vine, though numerous species of similar appearance attack plants not related, one of them being occasionally a serious pest on young apple trees. The parent beetle is the most troublesome form, eating the buds even before they expand, and attacking the young leaves as they unfold. The eggs are laid on the leaves, or on the buds from which the leaves appear. The young are like those of the common potato-beetle, in that they feed on the leaves with the adult, so that considerable injury is thus done the vine during the earlier weeks of its growth. The larvæ enter the soil an inch or two and there transform, the adults appearing toward midsummer, and feeding thereafter upon other plants, apparently, as well as the grape. These beetles are believed to hibernate in their condition as adults, and appear next spring, to repeat the injurious attacks of their predecessors.

It is evident from this account that this insect is open to destruction in a satisfactory way in two stages, as the beetles and the grubs feed alike exposed to the action of an arsenical spray; in accordance with our practice, this can be most economically applied with the Bordeaux mixture; the first application with the poison to be made at the opening of the buds, the second at the appearance of the larvæ.

My own experience with this insect has convinced me that where the beetle appears in numbers effective treatment may be needed to save the crop, if not the life of the vine. It is scarcely credible to one who has not witnessed the unchecked work of this insect what damage may result. Our trials of the capture of the beetles by kerosene pans has shown us that this method is much more expensive and less satisfactory than the application of Paris green.

## DISCUSSION.

A MEMBER: What is your objection to London purple?

PROFESSOR POPENOE: It is a waste product; and we do not know the proportion of arsenic in that we are applying. If we use an ounce in ten gallons we may get enough, and we may not.

A MEMBER: How about Paris green?

PROFESSOR POPENOE: It is not absolutely certain. It should only be bought under a guaranty. In our chemical tests it was shown that most of the Paris green which we tested was fairly reliable.

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REPORT ON VINEYARDS.

By G. F. ESPENLAUB, of Wyandotte county.

The grape crop has been an unusual one. The weather at blooming time was very favorable and they set very heavily. The dry season continued, and at one time threatened to ruin the crop. Bunches hung limp, and berries showed signs of shriveling; but in the nick of time rains came and started them into new growth. Moore's Early ripened well, but Concords had many green berries when about ripe; this caused a delay in getting them off to market. Showers of rain and early frosts hastened the ripening, and good prices were obtained. Wordens were yet worse than Concords; the early ripening berries were wasting before other yet green berries showed signs of ripening, and many never reached marketing condition.

The safest land for grapes in this country are the so-called white oak or clay lands. On this land grapes seldom rot, but on the black lands and rich prairie there is often much loss by rot. The dry season suited so well that all had good crops, and good prices were obtained. There is no doubt in my mind that rot can be prevented by timely and oft-repeated spraying with Bordeaux mixture. By timely, I mean spraying before the buds start, heavily, and with a strong mixture; after they are out in full leaf, spray every two weeks with the regular mixture until danger of rot is over or the dry season sets in.

The most profitable varieties for market are: Moore's Early and Concord, for black; Niagara and Moore's Diamond, for white; Woodruff Red and Goethe, for red. Goethe succeeds best on a sunny slope, on rather thin land; on rich, loamy land it grows too rank and is subject to mildew. Campbell's Early is making a good record; it is early, of good quality, and has a good skin. Wyoming Red is as good as Delaware; the vine is a much better grower and hardier. McPike is worthy of trial by all who love a good grape; it is wonderful in bunch and berry, and the quality is very good. Grape growers feel very well satisfied with the crop of the past season.

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NEW VARIETIES OF GRAPES.

By A. L. ENTSINGER, of Silver Lake.

As I am a member of the Committee on Vineyards, the part assigned to me is, "New Varieties of Grapes." Although I have tested and am still testing new varieties, my hands are partially tied, as I am testing many varieties on restrictions. Some I dare not speak of, as they do not do well with me; and as they may do well with others, I do not wish to do the introducer any harm. I wish it understood that when I recommend a new grape it is one that does well

with me. In 1895 I received four different varieties of seedlings from Mr. E. F. L. Routenberg, of Lincoln, Ill., as follows:

Clariessa, a perfectly white grape, with vine resembling the *labrusca* or northern Fox grape; bunch and berry medium size, very compact, good flavor, but rather small for market; very productive.

Moltke is another from the same party. It is a reproduction of the Agawam, or so near like that variety that I can see no difference.

Amelia is black; bunch and berry medium; think it has too much *vinifera* blood; is not perfectly hardy here, although the winters have been very serious since I received it.

Chicago is much like Delaware; almost a reproduction.

Tenison White is a strong grower, but was broken off by the wind and has not fruited yet.

In 1895 I received from Mr. C. Engle, of Paw Paw, Mich., Bonnie Doon, a red grape, to all appearance a reproduction of Brighton. I will give the notes as they appear on my book: September 1, 1897, about ripe; beautiful, like Brighton. September 10, 1898, fairly ripe, very fine; one of the very best. October 1, picked two full baskets from the one original vine; I class this among the best. In 1899 it suffered quite severely; producing only a few bunches. If I lived 100 or 200 miles farther south I would plant thousands of this.

Guiverna White is a very fine white grape; fair-sized bunch; berry size of Niagara and much like it; perfectly hardy, and of good, pure flavor; promising.

Chidester is all that can be desired in an American seedling grape, so far as fruit is concerned. It is about the color of Catawba; bunch and berry about same as Concord; flavor superb.

Chandler's Seedling has had more bad luck than any vine I have received for testing, but it has come right to the front. It is much like Pocklington, but has a larger bunch and berry; very strong grower, perfectly hardy, and worthy of trial.

All of the above are undisseminated varieties. No vines or cuttings for sale.

Berkman is a seedling of the Delaware, but much better in many respects; about the size of Delaware, same color, smaller seeds, of good flavor, and perfectly hardy; a good dessert grape and good grower.

Campbell's Early is all that can be desired in quality of fruit, but the vine has not proven hardy with me.

McPike is one I have tried two seasons, and yet it has not reached the trellis; perhaps there is something wrong with this particular vine. A Hicks, set at the same time and only eight feet distant, bore five nice bunches and three small ones. We believe the Hicks will step in front of Concord before very long.

St. Louis was set two years ago, and last season bore thirteen small bunches. It is perfectly hardy and a good grower.

Ozark is a hybrid of *estivalis* and *labrusca*. It is a very fine grape, perfectly hardy, a rampant grower, and requires careful pruning for best results; bunches long, quite loose; black, fine size, and very late.

Pawnee beats them all for productiveness. One two-year-grafted vine had forty-three bunches of medium to small berries. It is of the *estivalis* family and very late.

Green Mountain is a white grape and a favorite with all who test it. It is perfectly hardy, a good grower, and productive to a fault; as early as Moore's; pure, and very sweet; I like it.

THE POMOLOGICAL SOCIETY, THE PARIS AND THE  
PAN-AMERICAN MEDALS.

Since the annual meeting there has arrived at the rooms the Wilder silver medal for which we exhibited at the late meeting of the American Pomological Society, in Buffalo, N. Y., on September 11, 12, and 13, 1901.

Also, on February 14, a bronze medal arrived from the Paris Exposition. Our displays at the Paris Exposition made in 1900 were awarded four premiums—one third premium, and three gold-medal diplomas. The diplomas will arrive shortly and show the grade of the award, but all medals furnished by the management are alike, and of bronze. If silver or gold is awarded, the medals of such metal, if desired, must be purchased of the contractor manufacturer and paid for by the exhibitor.

A silver medal is expected daily from the Gorham Manufacturing Company, awarded at the Pan-American Exposition, in Buffalo, on the same collection winning the above Wilder medal. The manufacturer, in a late letter, said he would forward it about February 15.

The following medals, in addition to the above, all awarded for displays of Kansas fruits, are now on exhibition in the rooms of the Society:

A gold medal, awarded by the Pennsylvania State Horticultural Society to this Society, at Philadelphia, in 1869.

A Wilder silver medal, awarded by the American Pomological Society, at Richmond, Va., in 1871.

A silver medal, by the New Jersey State Agricultural Society, at Waverly, N. J., in 1873.

Two bronze medals, awarded at the World's Columbian Exposition, Chicago, 1893.

All horticulturists in Kansas should at once take an interest in the coming world's fair, at St. Louis, in 1903, and prepare to help in the grand display, determined that Kansas shall add new trophies and laurels to her already long list. Do not hesitate, but determine to do, and also encourage your diffident brother to assist. The first, most important and profitable step is to secure a life membership (see constitution) in the Kansas State Horticultural Society.

With best wishes for the success of all horticultural lines in Kansas,

Your secretary, WILLIAM H. BARNES.

OBITUARIES.

WHEREAS, Judge Samuel Miller, of Bluffton, Mo., Robert H. Bishop, of Salina, Kan., and J. F. Martin, of Winfield, Kan., members of this Society, have been called into the great hereafter: therefore,

*Resolved*, That this Society hereby gives expression to its appreciation of their worth and services as citizens and horticulturists while they were with us, and its grief for their loss, and we tender our sympathies to the respective families of the deceased; and be it further

*Resolved*, That these resolutions be incorporated in the secretary's report of the proceedings of this Society.

EDWIN TAYLOR,  
E. B. COWGILL,  
C. W. MUEFFELDT,  
Committee.

The following amendment to article 7 of the constitution was offered and read by F. W. Dixon, of Holton, and in accordance with article 10 it lies over until the next annual meeting, December, 1902:

Amend article 7 by adding, after the word "election," in the last line, these words: *No officer, except the secretary, shall succeed himself.* (See constitution, printed on page 5 of this book.)

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The thirty-sixth annual meeting will be held in the rooms of the Society, in the state capitol, during the last week in December, 1902. One hundred dollars will be offered in premiums. Send for program after October 15, 1902.



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